

COMPUTERWORLD

INSIDE

Executive Report —
The restructuring of
MIS: Rethinking the
data center.
Page 65.

In Depth — Whither
IBM's Token-Ring
gateway? Page 81.



Profile:
Export
agency official
and partner
turn black-
eye system
into Gold Medal Award win-
ner. Page 87.

GM pushes for ISDN
showcase similar to
the MAP event. Page 10.

No price gripes as Apple
rolls out Mac SE/30. Page 6.

M&D users take cover
as company sells off
manufacturing package
to Andersen Consulting.
Page 14.

IBM shining, DEC
recuperating, analysts
say, in wake of financial
results. Page 117.
Around the rest of the in-
dustry, results generally de-
clined. Page 93.

Five years later,
Microsoft is finally ready
to deliver applications
for Windows. Page 12.

Rolm users eager for
Siemens-IBM pact to be
spelled out in service terms.
Page 4.

Bankruptcy cloud shadows CIS

BY CLINTON WILDER
CW STAFF

Mid-size computer leasing companies "either have to grow or die."

— CIS Chairman Harry E. Goetzmann Jr. [June '87]

SYRACUSE, N.Y. — For Continental Information Systems Corp., bigger was most assuredly not better.

CIS' Jan. 13 filing for protection under Chapter 11 of the U.S. Bankruptcy Code evoked dark memories of the Itel Corp. bankruptcy of the early 1980s. But it is not expected to cast a cloud over the entire leasing industry.

Rather, the CIS scenario highlights how fast things can turn sour after a major acquisition — especially in a fiercely competitive industry in which reputation and creditworthiness are tantamount to survival.

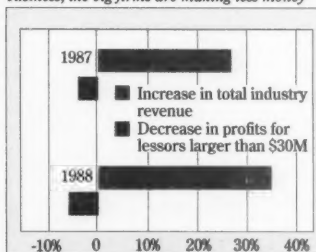
Now, with the taint of bankruptcy protection, the second-largest U.S. independent computer lessor will face its biggest challenge yet in assuring computer lessees that it will be a viable player.

"I'm not going to consider

them [for future business] — no way, shape or form," said Martin Phipps, operations officer at Baltimore-based Provident Bank of Maryland, which has current CIS leases for an IBM 3083 CPU and a 3380 and several 3330 disk drives. "People are scared to death."

The big pinch

Although leasing companies are doing more business, the big firms are making less money



SOURCE: COMPUTER DEALERS & LESSORS ASSOCIATION
CW CHART: JOHN YORK

Nonetheless, CIS lessees should see little change in their current leases, although their lease payments may go to a bankruptcy court trustee or other party. Many lessees are already paying directly to a CIS lender, as CIS sold its equity in many deals during the past few

months to help ease its cash flow problems.

"There really should be no impact on the customer at all," said L. Crandall Hays, who follows CIS for Milwaukee-based investment firm Robert W. Baird & Co.

CIS sought to reassure its customers that little should change, at least in the near term. "It is our intention to do business just as we have before, and the Chapter 11 filing affords us the time to restructure," said Paul Brooks, CIS vice-president of corporate communications. "I think we have a lot of loyal customers and believe our sales force is capable of maintaining those relationships."

The seeds of the CIS downfall were planted in the company's bold 1987 buyout of archival CMI Corp. in Bloomfield Hills, Mich. CIS vowed that the \$160 million deal would create a leasing giant that would rank near IBM Credit Corp. and Comdisco, Inc. in strength, stability and success.

Instead, the deal created a highly leveraged business that,

Continued on page 6

Compaq will test 386 limit

BY WILLIAM BRANDEL
CW STAFF

Compaq Computer Corp. is again prepared to raise the ante in the personal computer speed game with a spring release of an Intel Corp. 80386-based system that runs at a 33-MHz clock speed, according to several sources close to Compaq.

The PC, which reportedly will incorporate an unreleased version of the Intel processor, will break away from the 25-MHz performance plateau of current high-end systems.

The \$10,000 system will be housed in a Compaq Model 20E chassis. Intel's new microprocessor, which is not yet generally available to customers, will run at 33 MHz, an Intel spokeswoman said. Currently, the fastest 386 runs at 25 MHz.

Compaq's strategy is to launch the machine before IBM makes its expected low-end product blitz this spring, accord-

Continued on page 8

VAX power curve due for overhaul ...

BY JAMES DALY
CW STAFF

Digital Equipment Corp. will add processing power to the heart of its VAX family tomorrow, introducing a series of machines that will collide with existing product lines and put a price/performance squeeze on the high-end VAX 8800 models, sources close to the company said.

The multiprocessor-based 6300 line will be fired by an improved CVAX microprocessor that can handle 4.2 million instructions per second, making it more than 30% faster than the

6200's 2.8-MIPS processor, said John Logan, executive vice-president of the Aberdeen Group, a Boston-based market research firm. The machines will

also offer the added capability of placing as many as six processors into a single system, he said.

Sources expect the 6300 models to be only 5% to 7%

... while Wang aims higher

BY ROSEMARY HAMILTON
CW STAFF

Wang Laboratories, Inc. plans to announce a high-end mini-computer next week — its first offering in the double-digit MIPS category.

But analysts contacted last week said the system is still not enough to give the firm the big boost it badly needs.

A company official confirmed last week that Wang will introduce the VS10000, a uniprocessor system estimated to run at 12 million instructions per second, which is roughly four times the performance of its current high-end machine, the VS7310.

Despite this leap in performance, analysts contacted last week were not bullish on Wang. Noting the disappointing quarterly results the company reported last week (see related story page 93), analysts said Wang is facing an uphill battle for new

Continued on page 6

more costly than the popular 6200 series; base prices for the four-member 6200 line range from \$175,300 for the 6210 to \$556,600 for the 6240.

If these indications prove true, the 6300 could discombobulate the multiprocessor VAX line by putting intense price/performance pressure on the 8800 series; like the 6200, the 8800s consist of one to four VAX 8700 processors and are capable of performing symmetrical multi-processing.

A top-of-the-line six-processor 6300, for example, could offer more than 20 MIPS for around \$600,000, while the 8840 offers 22.2 MIPS for \$1.5 million.

The Maynard, Mass.-based firm would most likely put the 8800 models on life-support by cutting their price, Logan added.

DEC will also reportedly offer 6200 users the option of swapping their old processors for the new models for a cost of about \$8,000 per processor. The 6200

Continued on page 117

NEWSPAPER

#6300***** 5-DIGIT 48106
#U1U7ZE380M039068# 0010110087

UNIVERSITY MICROFILMS INT
UNIVERSITY MICROFILMS INT
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

339

SECOND CLASS MAIL

IN THIS ISSUE

Cultivating connections. Hewlett-Packard plans two-part project to link OS/2, DOS and Unix and extend this support to Ethernet, token-ring and other networks. Page 8.

Window dressing. Microsoft gets cracking on Windows products with pending introductions of a word processor and graphical DBMS. Page 12.

NEWS

- 4 Friday the 13th virus plagues Silicon Valley.
- 4 Rolm users eager to be under Siemens' wing.
- 6 Customers applaud new middle-of-the-road Mac's power, pricing.
- 6 DEC wins another VAXBI infringement concession.
- 7 Novell, Apple Open Link Interface targets LAN protocol, adapter developers.
- 7 Apple lowers selected Mac prices to lure buyers back.
- 8 Separate E-mail system users can pass notes, thanks to AT&T, Dialcom accord.
- 10 General Motors promotes ISDN interoperability forum to bolster product efforts.
- 14 PIOS users are now responsible of Arthur Andersen.
- 15 Application-hungry Unisys micro too weak to batter AS/400, analysts say.
- 19 Japanese chip makers stretch microprocessor capabilities.
- 19 Geared-up Koreans vie for piece of the chip action.
- 19 Bad-luck worm excised by DEC vaccine.
- 117 Microsoft, Computer Associates cash in on fourth quarter.
- 117 IBM up, DEC down in profit picture.

SYSTEMS & SOFTWARE

- 25 Expert systems plug away at the routine.
- 25 DEC unleashes electronic watchdog.

MICROCOMPUTING

- 43 A year after bonding, DEC-Apple pair still has no offspring.
- 43 Magellan charts course for hard disk users.



All aboard the LAN gateway express. Page 81.

NETWORKING

- 55 Users waking up to LAN backup.
- 55 Plastic is first-string on Netronix fiber-optics team.
- 55 Gateways, bridges buttress Connet.
- 55 Low-priced OEM Advanced Network version hopes to undermine Apple, Tops palisades.

MANAGEMENT

- 87 Export duo's award-winning automation redeems bureau.
- 87 Tarkenton now calls plays for management team.

COMPUTER INDUSTRY

- 93 Fourth-quarter figures reflect keen competition.
- 93 Tumbling chip market dislodges 2,000 National Semi employees.
- 93 Former Unisys exec joins Northern Telecom.

Quotable

"They gobbled up too much portfolio for the cash flow they had and couldn't make the pieces fit."

RICK MUDROW
PACIFIC TELECOM

On Continental Information Systems Corp.'s Chapter 11 filing. See story page 1.

COMPUTER CAREERS

- 98 Consultants are their own tough acts to follow.

TRAINING

- 113 Clients can exercise several options in negotiating discount contracts.

TRENDS

- 118 RISC trounces CISC in head-to-head competition but still trails in applications.

EXECUTIVE REPORT

- 65 Data Centers are being outfitted for new responsibilities. By Patricia Cinelli.

IN DEPTH

- 81 Predicting — or trying to predict — IBM's LAN gateway strategy. By Zak Kong.

OPINION & ANALYSIS

- 21 Noonan learned by failure to succeed as a manager.
- 25 Barnes punctures the "twisted-genius" mythos.
- 43 Barney makes waves over DEC's PC efforts.
- 55 Keefe illuminates user's fiber-optics choices.
- 87 Young debates expansion of MIS' duty roster.
- 93 Wilder fears the Europeans are reaching for last pieces of the pie.

DEPARTMENTS

- 8 News Shorts
- 20 Editorial
- 22 Book Reviews
- 92 Calendar
- 107 Marketplace
- 116 Stocks
- 118 Inside Lines

NEWS

E-mail bust generates privacy rights uproar

BY J. A. SAVAGE
CW STAFF

SAN JOSE, Calif. — When deputies from the Riverside County, Calif., coroner's office raided the offices of the Alcor Life Extension Foundation, they were looking for the head of possible murder victim Dora Kent. They did not find the head, which had been cryonically frozen at death in hopes of later resuscitation. Instead, they took the foundation's eight personal computers, including the electronic mail stored within.

As a result, three San Jose computer consultants, led by Keith Henson, filed a class action lawsuit against the Federal Bureau of Investigation last month for failing to investigate what they claim was a violation of the Federal Electronic Communication Act of 1986. Henson said that while the county's search warrant allowed seizure of computers and storage devices, it did not specify confiscating electronic communications and thus violated federal law.

The consultants said they spent a year trying to get the FBI to check into the county's legal standing in seizing private communications without a warrant. According to the lawsuit, the U.S. Attorney's Office provided "no substantive response" to Henson's request for investigation. A letter dated Nov. 4, 1988, and addressed to Rep. Norman Mineta (D-San Jose) from the U.S. Department of Justice said that "there is no

competent evidence upon which to base a federal prosecution."

The U.S. Attorney's Office, on behalf of the FBI, has yet to file an answer to Henson's complaint and refused to comment on the lawsuit.

The class-action suit seeks to represent all users of E-mail as well as members of Alcor. The nonprofit organization will store all or part of the bodies of its members at death at very low temperatures "until medical technology exists so they can be revived," according to Hugh Hixon, Alcor board member. "Evading death is a very serious matter," he said.

Specialists in computer security law say that the Electronic Privacy Act is ill-defined and has little case law to back it up.

Jonathan Wallace, a New York attorney specializing in computer-related law, said the act's biggest problem is that "it doesn't clarify [E-mail such as Alcor's] status as a closed system."

He added that if the judge issuing the warrant was not told of the E-mail existence, then Henson "has a decent argument."

The act requires that a warrant can be issued for E-mail "only if a governmental entity shows . . . relevancy to a legitimate law enforcement inquiry."

The lawsuit asks that the FBI investigate the actions of Riverside County law enforcement in this matter. Meanwhile, the county, which is not named in the case, has handed its investigation into the possible homicide of Dora Kent to the grand jury.

Sperry patriarch dies

Probst built \$5 billion firm and guided merger

BY NELL MARGOLIS
CW STAFF

SALT LAKE CITY — Gerald G. Probst, the Sperry Corp. executive credited with shaping the former conglomerate into a \$5 billion computer giant and shepherding it through the 1986 merger that created Unisys Corp., died in his sleep at his home here early last week. Probst was 66 years old. The cause of his death has not been determined.

A decorated World War II pilot who plied his electronics expertise as a career officer in the U.S. Air Force's Research and Development Command before joining Sperry in 1961, Probst is remembered as a reserved, considerate executive who made a difference without making a fuss.

Moving from Sperry's de-

fense side of the business to the commercial side and attaining increasingly responsible positions within the firm, Probst focused on establishing Sperry's commercial products in a credible market position. As chief executive officer of the company in the early 1980s, Probst spearheaded the restructuring of the conglomerate into a technology-oriented company, divesting it of farm equipment and hydraulics divisions in the process.

"That was a very bold move for him because a lot of people on the board were associated with those companies," recalled Joseph Kroger, who served as president of Sperry during Probst's chairmanship.

Shortly after the merger was consummated, Probst retired from Unisys. However, he remained a member of the Unisys International Advisory Board.

SYSTEMS SOFTWARE FOR VM/VSE DATA CENTERS:

Only one company covers the two, completely.

Computer Associates introduces **CA-UNICENTER /II VM** and **CA-UNICENTER /II VSE**, the industry's only complete line of VM/VSE systems software that automates every major area of the data center.

Now, true compatibility among the VM and VSE components. Equivalent products for both environments offer the VM/VSE data center unparalleled advantages such as: a common catalog that simplifies tape management; security software that protects all data in your installation; job accounting information that is collected for activity in both VM and VSE, and much more.

Only Computer Associates provides common interfaces and full integration to give you unprecedented control from a central point, over both environments.

And only Computer Associates offers CA-UNISERVICE /II, a secure link between your mainframe and CA's Customer Service System, 24 hours a day. You get online access to software fixes, interactive problem resolution, product tutorials and more. No one else has anything like it.

Call Dana Williams today:
800-645-3003 (Ext. 0006).

**COMPUTER
ASSOCIATES**
Software superior by design.

- World's leading independent software company.
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers.
- Worldwide service and support network of more than 100 offices.

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

Rolm users look to Siemens

BY ELISABETH HORWITT
CW STAFF

Despite an unsettling silence from prospective partners IBM and Siemens AG, some Rolm Systems users are eager for the West German electronics firm to move in and fill the service vacuum they have experienced under IBM's regime.

Last December, the two vendors proposed the sale of Rolm's manufacturing and development arm to Siemens and the formation of joint service, marketing and research and development organizations. Their subsequent silence, while awaiting Federal Communications Commission approval of the proposals, has fostered widespread speculation that IBM is backing away from both Rolm and telecommunications.

However, some users seemed less concerned with how soon IBM will step down than with how soon Siemens will step up to its Rolm responsibilities. "We're hoping that Siemens will bring ISDN to the 9751 faster than IBM might," said Ferrell Mallorey, director of communications systems at Brigham Young University.

"I can see why IBM is bailing out of Rolm; I think [the 9751] is a piece of garbage," said William Fallace, communications coordinator at Southern California Gas Co., whose firm recently made a major 9751 purchase. "I would just as soon IBM bowed out completely; I've heard a lot of good things about Siemens, and I hope they'll step up with some kind of

magic to fix these things," he added.

The magic that Siemens apparently contemplates is transferring the best features of its own Saturn and Hicom lines to the Rolm private branch exchanges (PBX), and vice versa, according to company spokeswoman Susan Goff. "Both [firms] have strengths. For example, Rolm Phonemail is fully integrated into the 9750, while we OEM our own Phonemail. Saturn has stronger data communications."

Reassurance

The company plans to link and provide common technological enhancements to its product lines, rather than converging them, Goff said.

This is clearly meant to reassure users who envisioned Siemens treating its new Rolm PBX line as back numbers — as IBM reportedly has treated the older Rolm models. "Users would like to see Siemens restore support that Rolm was previously offering for its older 8000 and 9000 PBX lines, which IBM has been moving away from," said one telecommunications manager, who requested anonymity.

But the big question, analysts said, is how long IBM intends to share Rolm PBX support with Siemens. "Users are asking, 'Is IBM dumping Rolm or is it serious about creating a synergy with Siemens?'" said Bill Redman, service director of Local Area Communications at Gartner Group, Inc. in Stamford, Conn. "The pessimistic view is

that IBM will give lip service to the venture and bow out in a few years, leaving Siemens to mismanage Rolm, lose market share and not integrate the [Rolm] 9751 with Siemens PBXs."

IBM perplexed the industry by "being so gung ho about shipping 9751s," then moving to rid itself of Rolm, according to Eric Schmiedeke, product director at Eastern Management Group.

When the high-end PBX began shipping last April, Rolm jumped from third place in terms of market share — a spot it had held since IBM bought it in 1985 — to the No. 2 slot, just above Northern Telecom, Inc. and behind AT&T, according to the Parsippany, N.J., market research firm (see chart).

But while the 9751 won sales by filling a crucial gap in Rolm's product line, IBM also got accounts by selling the PBX at well below cost, particularly to its own large mainframe shops, Schmiedeke said. Thus, many users feel that IBM's move to form a jointly owned marketing

and service department with Siemens is simply "an interim step to divesting itself of the entire Rolm unit," he added.

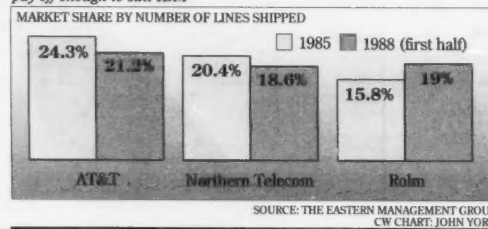
Linking PBXs to hosts

Rolm PBXs will continue to round out IBM's telecommunications product line, and IBM plans to work with Siemens to deliver on promised 9751 enhancements such as Integrated Services Digital Network, according to Frank Elliott, director of communications systems at IBM's marketing and services group. The Rolm switches — as well as other vendors' PBXs — will also play a role in IBM's plans to link PBX networking with host applications, he added.

However, Elliott indicated that IBM might not be committed to servicing Rolm PBXs directly, as one of its own products, over the long term. He cited IBM's Telecommunications Services Network Support program, announced last fall, which helps users pinpoint problems on their voice/data networks and contact the right vendor to provide service. Rolm, he said, "would come under that umbrella."

Close doesn't count

Since being acquired in 1985, Rolm increased market share but did not pay off enough to suit IBM



Friday the 13th virus back in Silicon Valley

BY MICHAEL ALEXANDER
CW STAFF

Dozens of firms in California's Silicon Valley were still battling last week to quash a virus epidemic that struck personal computers Jan. 13.

"The Friday the 13th virus has become a massive problem over the entire Valley," said John McAfee, chairman of the Computer Virus Industry Association of Santa Clara, Calif. "Seventeen companies and scores of individuals have contacted me about this latest epidemic."

Three machines and some 300 disks were wiped clean of the virus at EG&G Geometrics, Inc. in Sunnyvale, Calif., said Lynn Edwards, production supervisor. The virus corrupted programs on one of the personal computers at the same time it

was being used in a marketing presentation to senior executives of a prospective client. The contract bid, the culmination of several months' work, had to be rescheduled.

"We found out that we were infected when we suddenly lost all of our files," Edwards said. "The virus has since been cleared out, and we are in the process of putting things back together again."

Edwards refused to say exactly how the virus managed to work its way into the company's computers. "I am not absolutely certain, so I am reluctant to say where the virus came from because of the legal implications," he said.

McAfee said that several of the firms and individuals that contacted him reported they had either purchased PCs or had their PCs serviced at a popular

computer retail operation. He added that the outlet may have unwittingly transferred the virus to its customers' machines while formatting hard disk drives on new machines or when running diagnostics programs on personal computers being repaired. The manager at the retail operation identified by McAfee said he had no knowledge of the virus incidents.

Wipeout

The virus, which contained a "time bomb" set to go off on Friday, Jan. 13, was designed to infect and wipe out programs as they are executed. The same virus reportedly also hit hundreds of PCs in the UK on the same day.

The virus is thought to be a modified version of the Israeli or Jerusalem virus that plagued computer users in Israel over a two-month period last year.

That virus, believed to have been concocted as a political protest, was set to go off May 13, 1988, the day before Israel celebrated the 40th anniversary of its founding.

CORRECTIONS

Due to an editing error, the Solbourne Series 4/600 was incorrectly referred to as the Sun-4/600 in several references [CW, Jan. 16]. Product data should have appeared as follows:

The machines include the eight-model, one- to four-processor Series 4/600, which offers between 9.5 million and 30 million instructions per second (MIPS) and is capable of producing 1.6 million to 4.7 million floating-point operations per second.

By way of comparison, a two-processor Series 4/602 with 16M bytes of memory, a 327M-byte disk and a 150M-byte cartridge tape yields up to 17 MIPS for \$51,400 — bettering the performance of a similarly configured Sun-4/260 by 70% at a 14% price break, a Solbourne spokeswoman said.

Japanese electronics giant Matsushita Electric Industrial Co., which owns 52% of the firm and is manufacturing the Series 4, funded Solbourne's development effort with \$11.75 million.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin

News Editor
Peter Bartolik

Senior Editors
James Connolly, Management
Clinton Wilder, Industry
Elisabeth Horwitt, Networking
Patricia Keefe, Networking
Douglas Barney, Microcomputing
Stanley Gibson, Software
Michael Alexander, Microcomputing
Rosemary Hamilton, Systems

Senior Writers
Neil Margolis
Alan J. Ryan

Staff Writer
James Daly

New Products Writer
Sally Cusack

Features Editor
George Harrar

Senior Editors
Glen Kiffin
Joanne Kelleher, Spotlight
and Executive Review
Michael L. Sullivan-Trainor,
Special Projects

Senior Writer
David A. Ludlum

Associate Editors
Deborah Fickling
Kelly Shea

Assistant Editor
Sharon Baker

Researchers
Bonnie MacNeil
Kevin Burden

Chief Copy Editor
Mary Grover

Assistant Chief Copy Editor
Donald St. John

Features Copy Editors
Julie L. Cook
Joseph J. Patton

Copy Editors
Cathleen A. Duffy
Richard R. Pastore
Joyce Chutcheon

Art Director
Nancy Kowal

Graphics Specialists
Frank C. O'Connell
John B. York

Graphics Researcher
Laura O'Connell

Assistant to the Editor in Chief
Linda Gorgone

Editorial Assistants
Patricia Faherty
Lorraine Witzell
Megan Santous

Rights and Permissions Manager
Sharon Bryant

News Bureau
Mid-Atlantic
201/967-1350

Robert Moran, Correspondent
Washington, D.C.
202/347-6718

Mich Betts, Bureau Chief
West Coast
415/347-0555

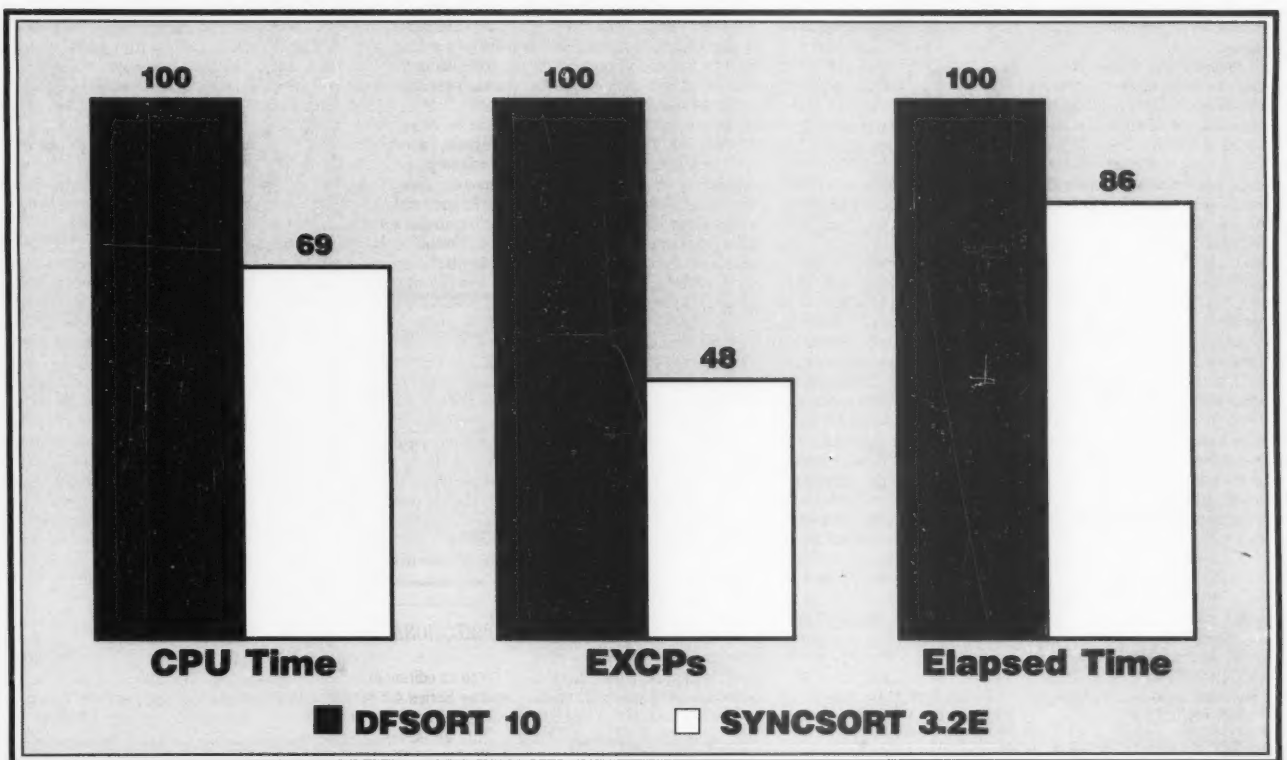
Julie Pitta, Senior Correspondent
J.A. Savage, Correspondent
Mary Elliott, Editorial Assistant

Midwest
312/827-4433

Jean S. Rozman, Bureau Chief
IDG News Service
Kathleen A. Gow, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
508/879-0700

SYNCSORT ESA VS. DFSORT on a 3090 with MVS/ESA



**ESA in 1989?
Make a date
with SyncSort.**

If your plans call for migrating to MVS/ESA and you are still using DFSORT, find out why SyncSort is the better choice.

Call us at (201) 930-8200 to arrange for a comprehensive benchmark on your system.

syncsort
INC.

Where Performance is the Issue.

Apple's SE/30 bridges Mac gap

BY JULIE PITTA
CW STAFF

SAN FRANCISCO — Apple Computer, Inc. last week introduced a Macintosh that users say is a bridge between the economy of entry-level systems and the power of the pricey Macintosh II.

Additionally, during introductions at Macworld Expo here, Apple unveiled enhancements to A/UX, its version of the Unix operating system, and Macworkstation, a tool for developing applications that allow the Macintosh to retain its "look and feel" when connected to a mainframe.

An extension to the Mac SE line, the Mac SE/30 is powered by Motorola, Inc.'s 68030 microprocessor running at a clock speed of 16MHz. Apple officials said it is up to four times faster than the entry-level Mac SE, which is based on the Motorola 68000. Apple officials have said the Mac SE, which features the traditional Mac look — a single unit for the monitor and base — will form the basis of one product family.

The modular Macintosh II has spawned a second product family. Mac SE and II users will be offered upgrade packages that allow them to migrate to more fully featured members of each respective product family. An upgrade kit allowing Mac SE users to attain Mac SE/30 functionality will be announced in the spring, officials said.

The Mac SE/30 will be offered in three configurations: an entry-level version with a single floppy disk drive; a mid-range model with a 30M-byte hard drive; and a high-end version with an 80M-byte hard drive. They cost \$4,369, \$4,869 and \$6,569, respectively.

The entry-level and 30M-byte hard drive configurations offer 1M-byte of random-access memory, while the 80M-byte hard drive model comes standard with 4M bytes of RAM.

All three models offer Apple's 1.44M-byte "high-density" floppy drive, also called the "Superdrive," which can read, write and format Microsoft Corp. MS-DOS and OS/2 diskettes. Used with the utility Apple File Exchange, Mac users can access and transfer MS-DOS and OS/2 files.

While Apple has been bashed for its pricing structure, the prices of the new systems along

While Apple has been bashed for its pricing structure, prices of the new systems, along with price cuts up and down its line were greeted warmly.

with price cuts up and down its lines (see story, page 7) were greeted warmly. "It's better pricing than I thought it was going to be," said Mary Howlett, manager of office automation for Hughes Aircraft Co.'s Ground Systems Group. "It offers us a nice middle-of-the-road system," she said. "We don't have to jump to a Mac II to get more power."

Howlett said the 68030 will offer users enough power to take advantage of an anticipated new version of the Mac operating system, which will reportedly offer multitasking capabilities.

Edwin Sund, senior systems engineer for Weyerhaeuser In-

formation Systems' PC support group, said the Mac's improved speed is a "godsend. Where you really need it is in networking and database applications."

"We're not going to dump our old Macs and buy [Mac SE/30s]," he maintained. "It'll be the workstation shuffle. The old Macs will be handed down to people who don't need the power, and we'll replace them with the newer models."

Macworkstation 3.1

Macworkstation Release 3.1 adds enhancements that will allow developers to create applications more simply than previously. Developers can paint dialogs directly on the screen rather than enter code to generate dialog boxes. Also, an event handler offers local intelligence for both the front and back ends.

A new release of A/UX adds support of X Window System Version 11, Release 3; offers the ability to run Hypercard and other desk accessories from the Apple Toolbox; and eases the development of Mac applications able to run on both the Mac operating system and A/UX.

A criticism of the first version was that many Mac applications would not run under A/UX as originally promised. Also users felt that it did not take advantage of the user-friendly features of the Mac operating system.

The new version will ship in March at a price of \$595 on diskettes. Support of X Window Version 11 Release 3 is an additional \$329.

As usual, Apple is setting high expectations for itself. "We believe it is our fate to develop the most influential intellectual and cultural tools known to mankind," said Jean-Louis Gasse, president of Apple's Products Division.

DEC settles VAXBI suit

BY NELL MARGOLIS
CW STAFF

Digital Equipment Corp. and EMC Corp. settled their legal differences out of court last week, with each company declaring itself the winner.

Under the terms of the accords announced last week, EMC acknowledged infringement of DEC technology rights; the \$127 million firm agreed to pay DEC \$100,000 for patent infringement and to cease making, using or selling the VX82 and VX83 memory products.

"Our hearts said fight, but our brains said settle," said W. Paul Fitzgerald, vice-president of finance at Hopkinton, Mass.-based EMC. He contended that his company does not believe it

infringed on DEC's property rights but was nevertheless willing to concede to the charge to forestall a costly litigation that could lead to no better than a Pyrrhic victory.

The products in question, Fitzgerald said, had produced so little revenue that they had already been targeted for deletion from the EMC line. On the other hand, facing DEC in court was likely to cost at least four times what EMC paid DEC in the settlement, he added.

In related news, DEC and EMC filed a consent judgment and settlement agreement with regard to EMC's outstanding breach of contract claims against DEC. Both parties agree to uphold the original contract, which, Fitzgerald said, was EMC's goal.

Wang

FROM PAGE 1

mid-range dollars.

"For the first time in a decade, IBM has a competitive mid-range offering," said Michael Geran, an analyst at Nikko Securities in New York. "That's causing trouble for everyone. DEC is responding this week, Unisys already responded and now Wang will. It's a cat fight."

The new system is the second recent offering from Wang that goes up against the Application System/400, IBM's rising star in the mid-range arena. The company introduced the low-end VS5000 shortly after the AS/400 announcement last year.

According to Marty Gruhn, vice-president of The Sierra Group, Inc. in Tempe, Ariz., the company needs more than "a new mousetrap" to help it along. "They need to focus on new business, instead of depending on upgrades," he said. "They

fixed up their financials somewhat in the last year by going back to the installed base. But that's over. You can't keep getting blood from a turnip."

The VS10000 is currently installed at several beta-test sites, including Admiral Cruises in Miami, according to a Wang spokesman. David Breeze, MIS director at Admiral Cruises, confirmed that his company installed a system in December and recently went into production mode with it. He would not provide more details because of a nondisclosure agreement.

The Wang spokesman said the VS10000 announcement will include software enhancements as well as a new disk subsystem that will accommodate 1G-byte disks. The high end will run the VS operating system as well as VS/VM, which allows a Wang system to run both VS and its Unix implementation concurrently. The system will be air-cooled and based on emitter-coupled logic technology, he added.

Bankruptcy

FROM PAGE 1

when it began to stumble, created a chain reaction of stockholder, lender and customer doubts, all feeding off each other.

"When you lose your credibility, all those things happen very quickly," said Richard Kazan, chairman of Capital Associates, Inc., the third-largest U.S. independent lessor. "It just shows you how fragile that credibility is."

Some lessees saw a difference in service and responsiveness very soon after the CMI buyout. "They spread their people so thin that it wasn't possible to maintain the same level of contact" with customers, said Rick Mudrow, purchasing coordinator at Pacific Telecom in Vancouver, Wash. "They gobbled up

too much portfolio for the cash flow they had and couldn't make the pieces fit."

The CMI acquisition strategy worked for a while, as CIS generated record revenue and profits in the first six months after finalizing the acquisition in August 1987. CIS even felt confident enough to add two smaller acquisitions for a total of \$5.2 million in that period.

But things began to unravel in CIS' 1989 fiscal year, begun March 1, 1988. The biggest problem was the \$110 million former CMI debt that CIS agreed to take on as part of the acquisition.

To service that debt, "CIS needed to increase both business

Bump in the road

Continental Information Systems' acquisition of CMI has led to red ink and shelter from creditors

	Revenue	Profit/loss
	(in millions)	
Q3 1987 ¹	\$77	\$3.4
Q4 '87	\$90.6	\$3.8
Q1 '88	\$83.1	\$2.9
Q2 '88	\$91.4	\$2.8
Q3 '88	\$155.6 ²	\$5.6
Q4 '88	\$217.3 ²	\$4.8
Q1 '89	\$148.7 ²	-\$7.5
Q2 '89	\$212.2 ²	-\$2.7

¹ Fiscal year ends Feb. 28

² Reflects acquisition of CMI

volumes and margins," said Thomas J. Donovan, director of investment banking services at Framingham, Mass.-based mar-

ket research firm International Data Corp.

"The 1988 market did not provide the opportunities," he said.

Many lessors felt the pinch in 1988 as a newly aggressive IBM Credit quoted low rates that cut profit margins to the bone [CW, Oct. 10, 1988].

In addition, Donovan said, leasing customers expected IBM's high-end 3090 models much earlier in the year and dramatically slowed their leasing activity until the 3090 S series began volume shipments in the fourth quarter.

CIS also suffered from mounting internal woes related to CMI, including incompatible computer systems. According to a source close to CIS, the company has not been able to integrate its Hewlett-Packard Co.-based information systems with CMI's

IBM-based applications.

CIS had acquired CMI without CMI's top management, which lost a court fight to block the sale. Several top executives immediately formed competitor Encore International, Inc. and eventually hired CMI founder Edward Cherney. Although many ex-CMI employees stayed with CIS, several key marketing managers went to Encore International.

CIS may have the potential to satisfy its creditors and exit Chapter 11, but its future beyond that remains highly uncertain. A deep-pocketed acquirer may be the only answer to restore the credibility that lessees demand.

"In any lease transaction, we take a jaundiced view of any company that appears to be having financial difficulty," Pacific Telecom's Mudrow said.

Apple takes a slice off Macintosh price

BY JULIE PITTA
CW STAFF

SAN FRANCISCO — Apple Computer, Inc. reduced prices on several models of its Macintosh personal computer last week to coincide with the debut of a system at Macworld Expo.

The reduction comes nearly four months after the company announced a dramatic price increase, which it blamed on the high cost of memory components. That hike was met with widespread criticism from Apple customers.

While users were pleased with Apple's

pricing changes, investors were apparently turned off by the company last week. Releasing its latest quarterly earnings report, Apple indicated that gross margins had decreased, prompting a decline in its stock price (see story page 93).

Apple USA President Allan Loren said last fall's increase altered customer buying patterns, turning them from more expensive, fully featured Macintoshes and toward cheaper, entry-level models. As a result, Apple is selectively dropping prices to "fully expand momentum" for the line, Loren noted. Also, memory components costs are falling, a trend that is

expected to continue, he said.

Prices for four memory-loaded Macintoshes were reduced. The Motorola, Inc. 68000-powered Mac SE with 2M bytes of random-access memory and a 40M-byte internal hard disk drive was reduced to \$4,369 from a previous level of \$5,069, a decrease of 14%.

A Motorola 68020-based Mac II with 4M bytes of RAM and a 40M-byte internal hard drive was cut to \$7,369 from \$8,069, a reduction of 9%.

Two models of the recently introduced Mac IIX, a Motorola 68030-based system, were also affected. The price of a

Mac IIX with 4M bytes of RAM and a flexible disk drive was trimmed by 10% to \$6,969 from an earlier price of \$7,769. A Mac IIX with 4M bytes of RAM and an 80M-byte hard drive was slashed to \$7,869 from \$9,369, a 16% drop.

Apple also cut prices on certain memory expansion kits for Macintoshes and a Laserwriter printer by 17%. Hard disk drive upgrades for the Mac were reduced by between 18% and 24%.

Users expressed pleasure at the price cuts. "It couldn't happen at a better time," said Edwin Sund, senior systems engineer at Weyerhaeuser Information Systems' PC support group. "We think there may be a downturn in the economy. We don't want to spend any more money than we have to."

Open Link firms Novell, Apple alliance

BY JULIE PITTA
CW STAFF

SUNNYVALE, Calif. — Apple Computer, Inc. and Novell, Inc. last week solidified their relationship by introducing the jointly developed Open Link Interface specification for third-party developers.

Introduction of the specification coincided with Macworld Expo in San Francisco and represents the second significant link between the two companies. Earlier this year, Novell introduced Netware for Apple's Macintosh, allowing Macs and IBM Personal Computers to coexist in a local-area network through the use of Novell communications software.

Novell also introduced source-routing drivers for IBM Token-Ring networks jointly developed with Ungermann-Bass, Inc. The product is said to allow users on Token-Ring networks running Netware to communicate across bridges using IBM Token-Ring Network Bridge software. The drivers are scheduled to be available sometime this quarter for \$75.

Guidelines for development

The Open Link Interface is targeted at developers of LAN protocols and adapters. Officials at both firms said it offers guidelines for developing the interface between LAN adapters and protocols on Microsoft Corp. MS-DOS and IBM OS/2 platforms. As a result, developers using the Open Link Interface can design products that interoperate, they added.

Jina Burns, vice-president of Infonetix, Inc., a Santa Clara, Calif., market research firm, said Apple's involvement in Open Link indicates the firm's commitment to networking. "It provides a really good platform for independent third-party card makers and LAN operating system vendors other than Novell," she said.

The specification is available to LAN vendors. A new release of Netware scheduled for later this year will include the implementation of the Open Link specification. A developer's kit for protocol vendors that will include Netware is expected in the second quarter for \$3,000. A developer's kit for LAN adapter vendors including Netware is expected in the second quarter for \$7,500.

VSAM DATA COMPRESSION Without the CPU Overhead

IAM REDUCES THE SIZE OF YOUR VSAM FILES BY 30 TO 70%

IAM'S FILE STRUCTURE — SAVES 20 TO 40%

IAM uses an advanced file structure which is far superior to VSAM. IAM's supercompressed index, freespace concepts and block sizes make much more efficient use of disk space.

IAM'S DATA COMPRESSION

SAVES AN ADDITIONAL 20 TO 50% DASD SPACE

Most files contain records with unused fields or repeating sets of characters. When IAM applies its proprietary compression techniques, the result is an additional 20 to 50% reduction in file size.

IAM's CPU time is dramatically less than competing compression products. In fact, since IAM's CPU time is normally much less than VSAM, IAM with data compression takes less CPU time than normal VSAM processing.

TRANSPARENT

Online systems (CICS), BATCH jobs, TSO, SMP/E and other applications make extensive use of key indexed VSAM (KSDS) files. IAM is a transparent alternative to VSAM KSDS files, which substantially reduces the impact of VSAM processing in your installation. There are no modifications to programs or JCL to use IAM files in place of VSAM.

AUTOMATIC RELEASE OF UNUSED SPACE

IAM takes the guessing game out of VSAM space allocation. Large amounts of disk space are wasted when users overestimate how much space VSAM requires or how many records a file will contain. VSAM cannot release overallocated space.



FREE VSAM SPACE SAVINGS ANALYSIS*

DATA SET NAME	SPACE SAVINGS		VSAM TRKS		IAM TRKS		% SAVINGS		TOTAL RECORDS	AVERAGE LARGEST	MAX LRECL
	ALLOC	USED	STD	COMPR	STD	COMPR	STD	COMPR			
BIG.CLUSTER	37155	37155	27855	15600	25	58			4754870	233502	580
CICS.FILE.MASTER	21000	18005	12720	9485	33	50			5088165	150150	150
NAME.ADDRESS.FILE	9315	6865	6465	1875	28	79			428529	6802080	2080

The VSAM simulation report displays the current size and data characteristics of your VSAM files and how much space IAM will save you with and without data compression.

*To see your VSAM usage, send for INNOVATION's free VSAM reporting programs.

Call for a Free No Obligation
90 Day Trial

Supports MVS, MVS/XA and MVS/ESA

Makers of FDR and ABR

INNOVATION
DATA PROCESSING

1275 Dutton Avenue, Little Falls, NJ 07424 • (201) 932-7200

NEWS SHORTS

Norris taps Soviet know-how

A Soviet computer science course, which has been under development by Soviet scientists for five years, is getting a careful look-see by U.S. computer scientists — but no military intelligence decoders will be needed for this effort. The William C. Norris Institute here, named after the Control Data Corp. pioneer, announced last week that it has concluded negotiations with the Soviet Academy of Sciences and Zodiak Computer Centre of Moscow to establish a joint U.S./USSR venture to develop and market computer technology-based software and courseware in both the East and West. The first product will be based on a Soviet course that offers a unique approach to teaching computer science, according to William C. Norris, chairman of the institute.

Banks launch EDI service

First Bank System (FBS) has entered into a joint venture with Westinghouse Electric Corp., Harbinger Computer Services, Citizens and Southern Bank in Atlanta and Marine Midland Bank in Buffalo, N.Y., to launch an electronic data interchange (EDI) service for the banking community. Headquartered in Atlanta, the new company, HarbingerEDI Service, is offering Intouch EDI, which consists of personal computer software and a network service compatible with the ANSI X.12 formats. It reportedly will link to other EDI systems. In particular, HarbingerEDI hopes to attract smaller firms that typically do not use EDI for other than payment services. FBS, along with the other two bank partners, are the only U.S. banks that have ventured into full EDI marketing, according to Terry Sandvik, a senior vice-president at FBS Cash Management Corp. Only a small percentage of U.S. financial institutions can receive corporate trade payments and properly process remittance information, he added.

Sprint enters price war

U.S. Sprint Communications Co. slashed its Clearline T1 service prices last week, offering customers potential savings of up to 66% over AT&T, the carrier said. Base prices for the service will fall as much as 25%, and volume prices will come down by as much as 48% as of April 1, Sprint said. The cuts were made in response to AT&T's recent spate of price reductions for its Accunet services as well as increasing competition from independent fiber-optic-based carriers, a company spokesman said. MCI Communications Corp. has yet to respond to AT&T's cuts with a similar tariff.

Microsoft powers up LANs

Microsoft Corp. has announced a minor upgrade for its OS/2 LAN Manager that reportedly will enable a LAN Manager-based network to support a virtually unlimited number of users and applications running concurrently. The upgrade is slated to ship to OEMs in March and will be offered to LAN Manager sites at no charge. According to company officials, the upgrade is said to increase the number of "file handles" in LAN Manager from the current 255 up to 64,000 and has no impact on other activities such as copying files to a workstation. File handles are a mechanism used to enable programs to access files and vary in number according to the application in use. This, in turn, regulates the actual number of users who can concurrently access a single package.

Wang into disaster recovery

Wang Laboratories, Inc. announced a program that provides equipment, services and personnel to restart computer operations following damage to Wang equipment. The fee for the Disaster Recovery Services program, an option to Wang's hardware maintenance service contract, is said to be 1% of the total cost of the customer's Wang equipment. The cost includes equipment repairs and replacement, shipping, installation and support time, the company reported. It will also cover the price of using an alternative processing site and expenses that exceed a customer's normal processing costs. Wang said on-site response to a customer's call would take place within an average of four hours.

X.400 users get E-mail bridge

BY MITCH BETTS
CW STAFF

Two electronic mail vendors, AT&T and Dialcom, Inc., announced the first commercial interconnection between E-mail services using the CCITT X.400 protocol in the U.S., which will enable users of the different E-mail services to exchange messages.

The interconnection will be commercially available during the first quarter of this year, the vendors said.

AT&T spokesman Jim McGann said there will be no additional charge for AT&T Mail users who send messages to Dialcom's E-mail service. Pricing has not been determined for messages sent from Dialcom to AT&T Mail, said Karen Chun, director of marketing services at Dialcom in Rockville, Md.

AT&T's decision reflects a trend among electronic messaging services suppliers to not double-charge subscribers who are sending messages to competing electronic data interchange services.

It remains to be seen how much user demand there is for E-

mail interconnection, Chun said, but she noted that the Aerospace Industry Association's initiative to create a multivendor E-mail network for the industry is an example of a business application for interconnected E-mail services [CW, Jan. 16]. Both AT&T and Dialcom are involved in that project.

X.400 connections between different E-mail services have been technically feasible since late 1987, but it has taken until now for vendors to hammer out agreements on revenue distribution and other difficult administrative matters, according to Michael F. Cavanagh, executive director of the Electronic Mail Association in Washington, D.C.

Too many cooks

Another issue stalling X.400 interconnection is that mail providers have been taking different approaches to building X.400 gateways. Even though the links technically conform to the standard, they cannot talk to each other, users have charged.

AT&T and Dialcom — apparently the first to develop a revenue distribution deal — have been leaders in the industry's In-

ternational Administrative Management Domains Operations Group, which is working to develop agreements on financial accounting between interconnected E-mail services.

In addition, AT&T and Dialcom announced an agreement in which users of FTS-Mail, the E-mail service AT&T will provide to the federal government under the Federal Telecommunications System 2000 contract [CW, Dec. 12], can get access to Dialcom's news and database services.

For example, FTS-Mail users will be able to access Dialcom's Procurement, which allows government agencies to send bid solicitations electronically to a typesetter for publication in the government bulletin "Commerce Business Daily."

The price of access to Dialcom's database services reportedly is still under negotiation, the vendors said.

Dialcom, which already provides information services and E-mail for 62 federal agencies, will also provide X.400 connections between its current federal customers and FTS-Mail users, a spokeswoman said.

HP opens LAN doors to PC workstations

BY PATRICIA KEEFE
CW STAFF

Hewlett-Packard Co. last week outlined a two-phased approach to OS/2 connectivity that encompasses support for DOS, OS/2 and Unix. This support extends to a mix of networks, including Ethernet, token-ring and broadband systems. HP LAN Manager, a version of Microsoft Corp. OS/2 LAN Manager, will enable DOS and OS/2 workstation users to access OS/2 file servers [CW, Jan. 16].

In the second phase, HP LAN Manager will be integrated with

HP LAN Manager/X Operating System 3 (LMX), a Unix version of LAN Manager co-developed with Microsoft. This reportedly will enable DOS and OS/2 users to go an extra step and access Unix-based servers such as the HP 9000 minicomputer.

"OS/2 is important to us," said Herschel Kenny, a system supervisor at Allied Signals, Inc. in Morristown, N.J., and an HP user. "Anything that will help us connect our PCs to our minis will be of assistance."

Together, the two software packages provide users with access to increasingly more robust

server services. HP is also encouraging developers to build integrated OS/2- and Unix-based applications.

Also, Transmission Control Protocol/Internet Protocol support coupled with Arpanet services support will enable PC users to avoid gateways when accessing applications and resources on compatible Unix-based office, engineering and manufacturing computers.

Both packages will be supported under HP's Openview. "HP's version of LAN Manager with hooks into Openview will allow users to centralize LAN management," said David Passmore, an analyst at Ernst & Whinney in Fairfax, Va.

Scheduled to be available in the second half of the year, HP LAN Manager software will be priced under \$3,000.

Compaq

CONTINUED FROM PAGE 1

ing to a source briefed by Compaq. With the new Intel processor, the Compaq system will be capable of 1.4 million floating-point operations per second (MFLOPS), the sources said.

Meanwhile, the IBM Model 70A-21, based on the Micro Channel Architecture, can attain 0.8 MFLOPS, said John Dunkle, vice-president of Work Group Technologies, a workstation research group in Exeter, N.H.

Dunkle said that a 33-MHz

Compaq machine would not be fully exploited until it included a 32-bit bus. With a 32-bit data path, he said, the machine could be used as a high-power computer-aided design and manufacturing workstation but will be primarily intended as a local-area network server. This strategy would allow Compaq to market the high-priced PC on a cost-per-seat basis, he said.

A Compaq spokesman said the 33-MHz machine was "not a subject up for discussion." An IBM source said the firm would "respond quickly" with its own high-speed machine based on the

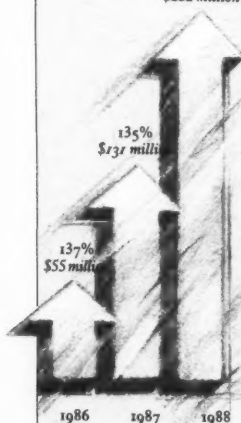
33-MHz processor-based system when it becomes available.

Compaq denied reports by two sources that the machine would be upgradable to an Extended Industry Standard Architecture (EISA) bus when that bus becomes available. But Compaq has previously disclosed that it intends to introduce an EISA machine in the \$10,000 price range some time this year. Shortly after the EISA bus proposal was announced in September, Compaq's Director of Marketing Mike Swavely said the EISA machines would mostly be used as LAN servers.

Can you name...

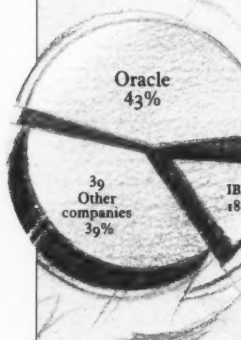
The world's fastest growing company?

115%
\$282 million



No other Fortune 1000 company is growing as fast as Oracle.

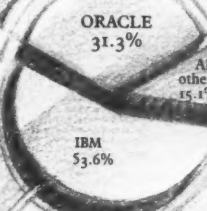
The world's largest relational DBMS company?



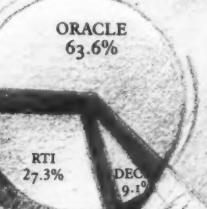
Oracle is more than twice as large as its closest competitor. (Source: Donaldson, Lufkin & Jenrette Action Recommendation, July 18, 1988)

The only software product in history that has been a success on

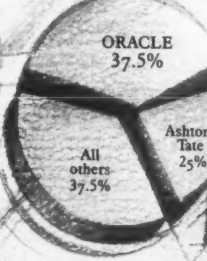
mainframes,



minicomputers,



and PCs?



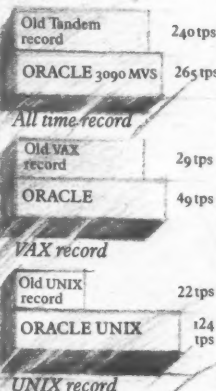
ORACLE is the only software in the world that lets you connect all your computers and share data. (Source: DATAMATION survey of IBM and IBM-compatible mainframe sites, 8/15/88)

The number one major software company* in customer satisfaction?

Rank	Product • Company
1	ORACLE • Oracle
2	System 1032 • Compuserve
3	Adabas • Natural • Software AG
4	Model 204 • CCA
5	RDB • DEC
6	Ingres • RTI
7	Focus • IBI
8	Unify • Unify
9	Nomad2 • Must Software
10	Supra • Cincom
11	Access DB • ADR
12	Ramis • On Line Software
13	Easytrieve • Pansophic
14	IDMS R • Cullinet
15	VAX DBMS • DEC
16	Informix SQL
17	SQL/DS • IBM
18	Inquire • Infodata Systems
19	Mantis & Ultra • Cincom Systems
20	System 2000 • SAS
21	DB2 • IBM
22	DLI • IBM
23	IMS • IBM
24	Answer DB • Answer Systems

ORACLE has the highest customer satisfaction rating of any major data management software product. The people have spoken. (Source: DATAPRO survey results, August 1988)

The world's fastest relational database management system?



The ORACLE DBMS holds the performance record in every major computer environment — IBM MVS, VAX/VMS and UNIX. Audited benchmark results are available upon request.

ORACLE is the only database software that runs on mainframes, minicomputers and PCs. Number one in performance. Number one in customer satisfaction. That's why people keep choosing ORACLE. And the company keeps growing. Faster than any other company in the world.

47 of the top Fortune 500 use ORACLE. So do most of the remaining Fortune 500. So if you need a DBMS, that lets you connect all your computers, register for the next free Oracle seminar in your area. Call 1-800-345-DBMS. You won't be the first.

U.S. SEMINAR SCHEDULE

AK	Anchorage	Feb 6af
AL	Birmingham	Mar 6r
	Huntsville	Feb 7g
	Montgomery	Feb 23
AR	Little Rock	Mar 16
AZ	Phoenix	Feb 7cfm
	Scottsdale	Mar 5a
	Tucson	Feb 14
CA	Costa Mesa	Feb 23ar
	La Jolla	Mar 23m
	Los Angeles	Feb 9am
	Ontario	Mar 16fm
	Oxnard	Mar 21fm
	Sacramento	Feb 2fm
	San Diego	Mar 21f
	San Francisco	Feb 15ap
	Santa Clara	Mar 29cf
CO	Colorado Springs	Feb 22r
	Denver	Mar 30g
	Englewood	Mar 7af
CT	Farmington	Mar 7f
	Stamford	Mar 21fm
DC	Washington	Feb 16g
FL	Boca Raton	Mar 16g
	Fort Lauderdale	Mar 8t
	Orlando	Feb 9g
	Pensacola	Feb 22
	Tampa	Mar 22c
GA	Atlanta	Mar 25c
	Savannah	Feb 16p
HI	Honolulu	Mar 14p
IL	Chicago	Feb 22a
	Springfield	Feb 28fm
IN	Indianapolis	Feb 21ar
KS	Wichita	Feb 16t
KY	Lexington	Mar 14c
	Louisville	Feb 7r
LA	New Orleans	Mar 31am
MA	Shrewsbury	Feb 16r
	Burlington	Mar 15af
	Worcester	Feb 8
MD	Baltimore	Feb 7t
	Bethesda	Mar 9ga
ME	Portland	Mar 15p
MI	Dearborn	Feb 7f
	Grand Rapids	Mar 8fm
	Lansing	Feb 14p
	Troy	Mar 21f
MN	Minneapolis	Feb 15cr
MO	Kansas City	Mar 14p
	St. Louis	Mar 23ap
NC	Charlotte	Feb 9t
	Greensboro	Mar 9fm
	RTP	Feb 15r
NH	Bedford	Mar 7r
NJ	Belleville	Feb 15f
	Princeton	Mar 15f
	Secaucus	Mar 2f
NM	Albuquerque	Mar 7f
NY	Amherst	Feb 1f
	Fairport	Feb 9f
	Meville	Feb 15f
	New York City	Feb 7au
		Mar 8u
OH	Akron	Mar 22f
	Brachwood	Mar 7r
	Cincinnati	Mar 23f
	Columbus	Mar 9f
OK	Oklahoma City	Feb 8fm
	Tulsa	Mar 15t
OR	Portland	Mar 16fm
PA	Harrisburg	Feb 9
	King of Prussia	Mar 31r
	Philadelphia	Feb 6f
	Pittsburgh	Mar 15f
	Scranton	Feb 15p
RI	Providence	Feb 1f
SC	Charleston	Mar 9r
	Columbia	Mar 23m
	Greenville	Feb 8f
TN	Knoxville	Feb 16c
	Memphis	Feb 16c
	Nashville	Mar 15r
TX	Austin	Mar 2r
	Dallas	Feb 15f
	Houston	Feb 9f
	San Antonio	Mar 3f
UT	Salt Lake City	Mar 28g
VA	Richmond	Feb 22c
	Roanoke	Feb 2
WA	Seattle	Feb 21f
WI	Madison	Mar 29au
	Milwaukee	Feb 22f

For Canadian Seminars

Call (800) 387-4407, except in Quebec, call (514) 337-0755.

The following key indicates additional afternoon seminars that are offered with these seminar dates:
a Integrating Macintosh into Corporate Network
c CASE Tools
f Oracle Financials
m Computer Integrated Manufacturing (CIM)
p PC Workgroup Solutions
r SQL • Reportwriter
t ORACLE Transaction Processing
v Value Added Relationship (VARs)

Please note:

g These seminars are directed to the Federal Government only.

* Only the indicated afternoon seminar is held on these days.

Attn: National Seminar Coordinator
Oracle Corporation • 20 Davis Drive
Belmont, California 94002

1-800-345-DBMS, ext. 8121

☐ My business card or letterhead is attached. Please enroll me in the FREE ORACLE seminar to be held

on these days

OR: COMPUTERWORLD

ORACLE®

THE HARDWARE-INDEPENDENT SOFTWARE SOLUTION

Call 1-800-345-DBMS, ext. 8121 today.

*Sales over \$10 million. Copyright © 1988 by Oracle Corporation. ORACLE is a registered trademark of Oracle Corporation. IBM, RTI, DEC, Ashton-Tate, Tandem, VAX, UNIX and other company or product names mentioned are trademarks or registered trademarks of their trademark holders. TRBA

20 Davis Drive, Belmont, CA 94002 • World Headquarters (415) 598-0800 • Oracle Canada (800) 387-2622 (except Quebec) • Quebec (514) 337-0755 • ORACLE Systems Australia 61-2-955-5888 • ORACLE Europe 44-1-948-6911 • ORACLE Systems Hong Kong 852-5-266046

GM proposes demonstration of ISDN interoperability

BY ELISABETH HORWITT
CW STAFF

GAITHERSBURG, Md. — Hoping to speed the availability of Integrated Services Digital Network (ISDN) products for its own networking strategy, General Motors Corp. has proposed an ISDN interoperability event similar to the MAP/TOP Enterprise Networking Event '88 affair held last summer.

Through its subsidiary Electronic Data

Systems Corp. (EDS), GM proposed that the ISDN Users Forum host a joint vendor demonstration on how ISDN products can interoperate. The forum meeting here last week gave an official go-ahead to a working group to start lining up sponsors for the affair, tentatively scheduled for May or June 1991. The official purpose of the event is to prove that ISDN is available here and now.

"We're trying to develop a total networking and information technology

infrastructure for GM, and one of our plans is to utilize ISDN," said Michael Kaminski, manager of communications/MAP at GM.

An ISDN interoperability event could "get technology, tests, products and [user] utilization there faster," Kaminski added. One critical element of EDS' proposal, which was not part of the Manufacturing Automation Protocol/Technical and Office Protocol event, is a vendor commitment to provide commercial availability of the products they demonstrate within 18 months of the exhibit.

This stipulation may be a major obstacle to vendor participation, forum attendees said, given the fact that ISDN still has some significant functional gaps that forum members — not to mention stan-

dards groups such as CCITT — are only beginning to address.

"Vendors have told us that they would only be willing to commit that what they show will become a product if ISDN is frozen," said Jim Kendrick, a U.S. Navy spokesman who chairs a forum subgroup, the ISDN Users Workshop. When the Enterprise '88 was held, MAP 3.0 had been frozen, guaranteeing that specifications for the standard would not be changed during the next six years, Kendrick pointed out.

Two of the biggest ISDN gaps pinpointed during the forum were network management and common programming interfaces that would ensure portability of applications across various vendors' equipment.

"People expect ISDN to diagnose itself; maybe it will in 15 years," said Paul Kirvan, president of Paul F. Kirvan & Associates.

Minor difficulties

At a meeting of the forum's Network Management Working Group, Patrick Krause, director of telecommunications at McDonald's Corp., reported a disquieting number of minor glitches on his company's ISDN network, which was installed by Illinois Bell on a trial basis in December 1986. Krause's group has dealt with an average of eight network malfunctions a day, 50% of which disappeared either before or during diagnostic testing, he said.

While conceding that his company is still on an ISDN learning curve, Krause asserted that the frequency of network glitches and the difficulty of locating their source had to do with the fact that an ISDN link requires many more devices and subconnections than, say, a classic modem-to-dial-up line link. He called for the forum to push ISDN standards bodies to come up with network management specifications.

Several forum members brought up the lack of a common application interface that would allow communications software to run across a variety of ISDN devices. ISDN software and equipment vendors claimed to provide some degree of portability now by supporting de facto industry standards such as IBM's Netbios, RS-232 and Hayes Microcomputer Products, Inc.'s AT command set. However, such protocols cannot take full advantage of ISDN capabilities such as 64K bit/sec. transmission rates or voice-related functionality, industry sources said. And support is far from universal.

The ISDN Software Interface Group, a subcommittee within the forum, is said to be addressing this problem by developing a common set of commands for applications to access ISDN services. But since the forum does not have the authority to create standards, vendor support of such commands would be strictly optional.

Even if these areas remain unaddressed by 1991, vendors can still demonstrate some degree of ISDN interoperability at the upcoming event. More critical is the lack of some crucial nuts and bolts within the basic networking standard, according to Shukri Wakid, forum chair and chief of the National Institute of Standards and Technology's Advanced Systems Division. The forum will be pushing standards committees such as CCITT to produce a version of ISDN that can be used in time for the event, he added.

Washington Bureau Chief Mitch Betts contributed to this report.

Taking a Hit?

LET OUR THREE "POWER PUNCHES" PROTECT YOUR SYSTEM PERFORMANCE!

Taking a hit in system resource monitoring and accounting?

VPAC—the unbeatable VM performance analyzer that puts automatic control of resource allocation at your fingertips, providing you with:

- graphic displays and comprehensive reporting
- early detection of system bottlenecks
- continuous exception monitoring
- dynamic control of system resources
- XA support

VSAM/TUNE—world's leading VSAM management and performance tool that:

- tunes clusters for optimum I/O performance
- dynamically allocates buffers
- provides on-line analysis and modeling
- plans and simulates for system growth without impact
- simplifies IDCAMS listings and generates control statements
- offers a single-product solution without the hassle of multiple VSAM software packages

SYSTEM ACCOUNTING—the perfect partner for the DOS/VSE environment with comprehensive analysis that supplements IBM data with accurate statistics, giving you:

- comprehensive optimization tuning
 - detailed load monitor and capacity planning
 - precise accounting for both CICS applications and system resources
- Look to these Macro 4 "power punches" when you need call for total precision in system performance monitoring.

TUNES: World's Best Session Management Tool • CICS/PRINT Spooling Package for CICS, JES and Power DUMPMASTER: Dump Management and Analysis Package • LOGOUT: Premier Console Manager for DOS/VSE



macro 4
Systems Software

Brookside Plaza, P.O. Box 187, Mt. Freedom, NJ 07970
(201) 895-4800 • (800) 223-0414

INTERNATIONAL OFFICE: MACRO 4 PLC Oxbelt Park House, Turners Hill Road, Worth, Crawley, West Sussex, RH10 4SS England (0253) 986090
OTHER OFFICES: France, Italy, Switzerland, Belgium, West Germany, Netherlands, Spain, Scandinavia, Israel, Australia, Japan and Pacific Basin

WE'LL HELP YOU DELIVER YOUR OWN
KNOCK OUT PUNCH!
CALL 800-223-0414
AND PUT THE POWER OF MACRO 4
IN YOUR CORNER.

We've been providing powerful solutions to MIS system problems on an international scale since 1968—with a full range of software solutions for VSE, VM and MVS operating system requirements.

ORACLE 5.1B IS HERE

More power to the people.

ORACLE has led a revolution in PC relational database technology. More power. More portability. More connectivity. More reasons than ever to make ORACLE your corporate standard database.



New tools with even more power.

We're proud to announce our newest release—Professional ORACLE Version 5.1B. Now you can run your applications in OS/2 or in protected mode above 640K in MS-DOS. So you have more room for more powerful applications. And those same applications run unmodified on almost all workstations, minicomputers and mainframes.

Version 5.1B delivers a new level of power to your PC developers including the latest versions of:

- **SQL*Forms®** NEW! Enhanced 4th-generation application development environment.
- **SQL*Menu®** NEW! Flexible interface builder for defining complex menu systems.

• **SQL*ReportWriter™** NEW! Non-procedural development and runtime powerhouse for producing any report.

• **SQL*Plus®** Oracle's ANSI-standard SQL query and administration tool.

• **Pro*C™** The C-language pre-compiler and subroutine call interface to ORACLE.

Learn SQL on us.

Learn the language of the revolution. Order Professional ORACLE today for \$1299 and we'll include ORACLE SQL*Tutor, a nine-module PC-based SQL instruction program that sells by itself for \$199.

Try ORACLE for \$199.

Our Trial Version is identical to Professional ORACLE, but can't be used in networked configurations and allows a maximum user database size of 1 MB. It's a powerful tool for prototyping your first ORACLE application. And its price can be applied to the purchase of a full Professional ORACLE license.

ORACLE®

COMPATIBILITY • PORTABILITY • CONNECTABILITY

Call 1-800-ORACLE1, ext. 8131 today.

Money-back guarantee.

If you haven't tried ORACLE yet, now there's even more reason to join the SQL revolution. More tools. More power. If ORACLE 5.1B doesn't revolutionize the way you develop PC database applications, return it within 30 days for a full refund.

Call 1-800-ORACLE1 ext. 8131, or an ORACLE MasterVAR today.

Dear Oracle

Oracle Direct • 20 Davis Dr. • Belmont, CA 94002
1-800-ORACLE1, ext. 8131

Since your 30-day money-back guarantee eliminates any risk on my part, please send me the software below. Enclosed is my ☐ check, or ☐ VISA ☐ MasterCard ☐ AmEx credit card authorization. Offer valid only in the USA. Please send ☐ 5.25" High Density or ☐ 3.5" disks.

- ☐ Professional ORACLE for MS-DOS with free ORACLE SQL*Tutor for \$1299 \$ _____
- ☐ Professional ORACLE for MS-DOS Trial Version for \$199 \$ _____
- ☐ Professional ORACLE for OS/2 for \$1299 \$ _____

Professional ORACLE Requirements: MS-DOS—80286/80386 PC with MS-DOS V3.1+, hard disk, 640KB of memory and 8096K extended memory required. 2.5MB of extended memory recommended (required for SQL*ReportWriter). OS/2—80286/80386 PC w/ OS/2 V1.0, hard disk, 3MB memory. SQL*ReportWriter not available for OS/2 and is replaced by SQL*Report.

- ☐ Just send ORACLE SQL*Tutor for \$199 \$ _____
- Minimum Requirements: 256K PC with hard disk. Color monitor suggested.

Subtotal \$ _____

Please add appropriate sales tax \$ _____

Total enclosed/authorized (USA only) \$ _____

NAME _____ TITLE _____

COMPANY _____

STREET (no P.O. boxes, please) _____

CITY _____ STATE _____ ZIP _____

PHONE _____

CREDIT CARD NO. _____ CARD EXPIRATION DATE _____

SIGNATURE _____ TODAY'S DATE _____ COMPWORLD

Opening more Windows

Word processor is one application Microsoft plans for this year

BY DOUGLAS BARNEY
CN STAFF

REDMOND, Wash. — So far, Microsoft Corp. has only lethargically supported its Windows interface with applications. But the company will spring into action with a rash of product releases beginning early this year and spanning the next two years.

Although Windows was announced in November 1983, after more than five years Microsoft still has only one major Windows application available with its Excel spreadsheet.

This will change sometime in the first half of this year when the firm that has so ardently preached the Windows way will finally announce the \$495 Windows Word. A word processor, Windows Word is in the late stages of beta testing. Following on its heels will be Omega, a graphical database management system currently in beta testing that will be out well before year's end, Microsoft said.

Eventually, most key Microsoft applications will be moved to both Windows and the OS/2 Presentation Manager, Microsoft officials said. Windows, however,

has proven to be a difficult and complex environment to develop for, even for Microsoft. As a result, some of these applications may be a long time coming. "Microsoft is like a Japanese company. They have the longest view of things of anybody. They are always thinking five years out," said one user at a Microsoft beta-test site.

Despite its sluggish move to Windows, the firm plans a quicker ramp-up for the equally graphical OS/2 Presentation Manager, with a mid-year release of Excel/PM. This product will essentially be a port of today's Excel for Windows with a \$50 upgrade charge, said Pete Higgins, general manager of Microsoft's analysis business unit.

Also on the horizon are Windows and

Presentation Manager versions of all key Microsoft applications. The firm will develop an entirely new version of Microsoft Project for graphics environments and will port versions of Microsoft Works and Powerpoint, a Macintosh presentation package, to Windows and the Presentation Manager, said Mike Maples, vice-president of applications at Microsoft.

Windows Word duplicates all the features of the \$495 character-based version of Word. The product includes a runtime version of Windows/286 and features a thesaurus, spell-checking, autosave, on-line Help, advanced formatting and the ability to customize the system for individual tastes and work styles, a beta tester said.

This product will also provide the setting for the debut of Microsoft's embedded macro language based on Quickbasic. This language, first discussed in October 1987, will eventually work across all graphical Microsoft applications and will also serve as the development language for Omega. As far back as October 1987, Microsoft dropped hints that Basic would be positioned as a database development language.

Omega, which some beta testers expect to be ready in the third quarter, will use this language. "It is like Dbase Windows," a beta tester said, referring to the fact that a programming language is central to the product. Ashton-Tate Corp. has the Dbase language; Microsoft has Basic. Omega will also serve as a front end for SQL Server, a database engine developed by Ashton-Tate, Microsoft and Sybase, Inc.

Like Quickbasic, this macro/database development language generates pseudo-code, or p-code, which essentially allows users to pseudocompile programs as they edit. The system created code that is "90% along the way to real native machine code," Microsoft explained.

Basically enhanced

Basic, however, has been enhanced for the graphical environments. "There are keywords and parameters that make it particularly good for Windows, dealing with things like fonts," the beta tester said.

There is more to Omega than just Basic. The product also contains so-called nonprocedural tools for reporting, querying and working with forms. This positions the product against Lotus Development Corp.'s Lotus/DBMS, which plans to provide a similar array of graphical database tools. The key difference, at least on the surface, is that Lotus will initially target the OS/2 Presentation Manager, while Microsoft will first squeeze its tools into the confines of Windows.

With the inclusion of Basic as a database development language, Omega will also be aimed squarely at Dbase, the DBMS from Microsoft SQL Server partner and rival Ashton-Tate.

Although a handful of programmers are already using Omega for applications development, the product is "still very flaky — prealpha really," said one East Coast beta tester.

Who should use Windows Word? "If you have a 6 MHz AT or less, I would recommend PC Word. If you have a 10-MHz 286 or more, I would recommend Windows Word," said Jeff Raikes, general manager of Microsoft's office business unit. Raikes said Word for the Presentation Manager should ship about three to nine months after Windows Word.

UPWARD COMPATIBILITY



LUCK HAD NOTHING TO DO WITH IT.

Strategy did. SynOptics Communications planned its LattisNet architecture to meet current customer needs while providing an upward migration path to the emerging 10BASE-T standard.

SynOptics' commitment to standards is built into each and every product we make. And it's been that way from the beginning. Today, LattisNet provides IEEE 802.3, AUI-compatible Ethernet at 10 Mb/s over unshielded twisted pair wire and a variety of other cabling media. Tomorrow, it will satisfy the new standard by offering 10BASE-T versions of LattisNet twisted pair host modules and twisted pair transceivers.

You'll simply install 10BASE-T LattisNet host modules into an existing premises or department concentrator. The new host modules and transceivers will provide 10BASE-T unshielded twisted pair compatibility and the AUI compatibility we offer today — while working right alongside the current LattisNet host modules in your networks. SynOptics' upward migration path to 10BASE-T has been built into the LattisNet architecture, starting with the very first concentrator we ever shipped.

Don't rely on luck. Rely on LattisNet.

 **SynOptics**
Communications, Inc.

For more information on SynOptics' upward migration path, call toll-free (800) USA-8023, Dept. 100.

501 East Middlefield Road, Mountain View, CA 94043-4015

LattisNet is a registered trademark and SynOptics is a trademark of SynOptics Communications, Inc. © 1988 SynOptics Communications, Inc.

100

100

Announcing ORACLE FINANCIALS

*"Ready for you only after
they work for us."*



Oracle Financials

Oracle General Ledger™, Oracle Payables™, Oracle Purchasing™ and Oracle Assets™ applications have world-class functionality, yet are so easy to use that you may not bother to read documentation. Not only can they do anything you need to do, but they do it effortlessly and on the computer of your choice — mainframe, minicomputer or workstation — at the location of your choice.

"...Oracle Financials seem too good to be true. They offer full-featured accounting capabilities... without having to write any applications."

— Howard Ember, Treasurer, Tootsie Rolls

The best software quality control in the world

"By being the very first production user, Oracle demonstrated their absolute confidence in the financial software they intended to sell. This quality control alone makes Oracle Financials worth a close look."

— David Thomas, Hambrecht & Quist

In three years, Oracle's sales grew from \$25 million to almost \$300 million. They went from 1000 customers to over 10,000, from 2 products to over 100, from \$15 million in total assets to over \$250 million with several major corporate reorganizations along the way. Oracle Financials were there every step of the way.

"Oracle Payables is one of the few packages we evaluated that can really deal with the demands of a very large company. And by being able to implement Oracle Financials on our existing minicomputers, we saved \$500,000 over the cost of other alternatives."

— Michael Prince, Data Processing Manager, Burlington Coat

"The flexibility of Oracle Financials lets us focus on our company's growth, not our accounting systems. Whatever your industry, whatever the size of your company, we are certain that these products will work for you. We invite you to attend the next Oracle Financials briefing and demonstration in your area."

— Jeffrey L. Walker, Senior VP, CFO Oracle Corporation

ORACLE

Call 1-800-345-DBMS, ext. 8110 today.

Copyright © 1988 by Oracle Corp.
Oracle Financials, Oracle General
Ledger, Oracle Payables, Oracle
Purchasing and Oracle Assets are
trademarks of Oracle. TBA

20 Davis Drive, Belmont, CA 94002 • World Head-
quarters (916) 358-1000 • Europe (407) 253-5123 • France
(01) 236-2381 • Sweden (08) 531-0751 • Canada (416)
298-7750 • ORACLE Systems Australia 61-2-959-5000 •
ORACLE Europe AG: 1-848-0011 • ORACLE
Systems Hong Kong 852-5-0888

Oracle Financials Seminars

AK Anchorage	Feb 6
AZ Phoenix	Feb 7
CA Scottsdale	Apr 11
CA Costa Mesa	Jan 24 Apr 25 Jun 22
Los Angeles	Jan 19 Mar 14 Apr 20
Ontario	Mar 21
Sacramento	Mar 21
San Diego	Jan 17 Mar 16
San Francisco	Jan 24
	Mar 29 May 18
Santa Clara	Jan 12 Mar 9
Universal City	Apr 6
CO Englewood	Jan 31 Mar 7 Jun 6
CT Farmington	Mar 7
Stamford	Mar 21 Jun 8
FL Boca Raton	Feb 7
Jacksonville	Jan 19
Miami	Jan 17
Tampa	Mar 22
GA Atlanta	Jan 17
Savannah	Apr 27
HI Honolulu	Mar 14
IA Des Moines	Jan 17
ID Boise	Apr 13
IL Chicago	Jan 25 Feb 28 Mar 21
	Apr 18 Jun 14
IN Indianapolis	Jan 31 Mar 22 Jun 7
KY Louisville	Apr 4
LA New Orleans	Jan 27
MA Boston	Jan 17 Apr 20 Jun 6
Burlington	Mar 15
MD Baltimore	Apr 12
Columbia	Mar 15
ME Portland	Mar 2
MI Dearborn	Feb 7 Apr 4
Grand Rapids	Jan 12 Mar 8 Jun 6
Lansing	Feb 14
Troy	Mar 7 Jun 7
MN Minneapolis	Jan 11 Mar 14 Jun 13
MO Kansas City	Jan 26 Jun 27
St. Louis	Jan 12 Mar 9 Jun 6
NC Raleigh	Jan 10
NE Omaha	Apr 6
NJ Iselin	Feb 15 Mar 30 Jun 28
Princeton	Jan 18 Mar 15
Secaucus	Jan 26 Mar 2 Apr 19
NM Albuquerque	Mar 7 Jun 7
NY Buffalo	Jun 6
East Syracuse	Jun 15
Fairport	Feb 9
Melville	Jan 18 Mar 15
New York City	Jan 25
	Feb 22 Apr 19 Jun 14
OH Akron	Feb 1
Beachwood	Apr 5
Cincinnati	Jan 26 Mar 23
Columbus	Jan 12 Mar 9
OK Oklahoma City	Feb 8
Tulsa	Jan 24
OR Portland	Mar 14
PA Philadelphia	Feb 6 Apr 10 Jun 19
Pittsburgh	Jan 18 Mar 15 Jun 14
Scranton	Feb 15
RI Providence	Feb 2
SC Charleston	Mar 9
Greenville	Feb 8 Apr 13
TN Memphis	Apr 19
Nashville	May 4
TX Austin	Jan 19
Dallas	Jan 10 Feb 1
	Mar 7 Apr 4 May 4 Jun 7
Houston	Jan 12 Feb 9
	Mar 9 Apr 6 May 4 Jun 8
San Antonio	Jan 20
UT Salt Lake City	Feb 1
WA Seattle	Jan 5 Feb 21 May 17
Spokane	Apr 25
WI Madison	Feb 22
Milwaukee	Jan 26 Mar 8 Jun 6

Attn: National Seminar
Coordinator
Oracle Corporation
20 Davis Drive
Belmont, California 94002
1-800-345-DBMS, ext. 8110

☐ My business card or
letterhead is attached.
Please enroll me in the
FREE Oracle Financials
seminar to be held

at: _____

on: _____

COMPUTERWORLD

100

100

M&D PIOS users get sold off

BY STANLEY GIBSON
CSTAFF

DALLAS — In a move that left users of the PIOS manufacturing resource planning system puzzled about their future, McCormack & Dodge Corp. handed PIOS over to Arthur Andersen Consulting last week. With an installed base of 75 sites, PIOS is used by a number of large defense contractors.

The transaction is part of an agreement between M&D and Andersen Consulting under which the two firms will jointly sell M&D's Millenium financial and human resources software and Andersen Consulting's Mac-Pac family of manufacturing software. Mac-Pac has roughly 600 installations, according to Andersen Consulting.

As part of the agreement, the two firms are integrating Mac-Pac with M&D's Millenium software. Although Andersen Consulting promised three years of maintenance for PIOS — which stands for Production and Inventory Optimization System — the firm also said enhancements will have to be paid for by the user base. An Andersen Consulting official said the firm would not sell PIOS to new accounts.

M&D employees who had worked on PIOS development and marketing will be offered positions with Andersen Consulting under the pact. Andersen Consulting said it has no plans to acquire M&D, now part of The Dun & Bradstreet Corp.

PIOS never caught on

M&D acquired the rights to the PIOS package four years ago from Rath & Strong, Inc., a Lexington, Mass.-based consulting firm, in an effort to diversify its product line. Although M&D sought to sell the package to the commercial market, it never caught on there.

"I'm disappointed. I think it's a good product that's going to go down the tubes for all the wrong reasons," said PIOS user Bob Herzog, director of Information Systems Services at Combustion Engineering in Windsor, Conn.

Herzog said his firm has no intention of moving to Mac-Pac. If Andersen Consulting withdraws support for the package later on, users should continue with development on their own, he said.

Malcolm McNeil, director of information services at Santa Barbara Research, a division of Hughes Aircraft Co. in Golita, Calif., said he cannot change from PIOS soon.

"There are a lot of users who have been trained, and a lot of money has been spent," he said. McNeil's firm has been migrating to PIOS for the past several years.

PIOS now runs with IBM's

IMS and Cullinet Software, Inc.'s IDMS databases but not with IBM's DB2. Paul Bellwood, at Northrop Corp. in Los Angeles, said he is interested in a DB2 version, which he said he understands is under development. However, an Andersen Consult-

ing official said there are no plans to offer a DB2 version of PIOS.

Several users said that M&D did not comprehend the selling cycle for manufacturing software, which is typically several years, in contrast to much briefer periods for financial software.

Rumors of the sale of PIOS to Andersen Consulting surfaced at the PIOS users group meeting in December. The group meets again Jan. 30 in Dallas. Andersen Consulting has been invited to address the group, said Bellwood, who is chairman of the users group.

Although Andersen Consulting reportedly paid M&D for PIOS and its associated employ-

ees, the amount was not disclosed.

M&D bought PIOS because many of its customers were manufacturing companies that wanted to sell a full range of products. PIOS, however, did not lend itself to being integrated with M&D financials, Bellwood said. M&D had recently lost money from its PIOS group, one source indicated.

PRIME and the Prime logo are registered trademarks of Prime Computer, Inc., Natick, MA.



WE HELPED SHAPE A

In 1914, production of the earth's first soft drink reached 2 million bottles a year. Today, it's over 2 million bottles a day.

And how does Verrierie de Languedoc (a subsidiary of Perrier) maintain the consistent shape and quality of this world-famous bottle?



With computer systems from Prime. We gave Verrierie de Languedoc the capacity to design and mass produce their bottle molds on digitally controlled units. This integrated CAD/CAM (Computer-Aided Design/Computer-Aided Manufacturing) system from Prime makes production more efficient and the drafting board passé.

Unisys Micro A desktop tied to 4GL

Current lack of applications minimizes threat to AS/400 market share

BY ROBERT MORAN
CW STAFF

NEW YORK — Unisys Corp. last week announced the Micro A, a desktop extension of its A series mainframe architecture

that the company hopes will capture as much as 40% of its sales from new accounts and drive prospective Application System/400 users away from IBM.

However, observers said that the system could till new soil for

Unisys that could later nurture sales of larger processors but that the application-deficient system will cause little problem for the AS/400.

With the Micro A, available today, the company has condensed the A series mainframe

on a single chip, called the Single Chip A-Series Mainframe Processor, or Scamp. The chip, along with 12M bytes of memory and I/O logic, has been placed on an expansion board that slides into a specially equipped Unisys PW2 Series 800 personal workstation. The Micro A runs the A series MCP/AS operating system, which adds \$5,000 to the

hardware cost of \$20,365.

In addition, the Micro A contains an Intel Corp. 80386 processor and the Microsoft Corp. OS/2 operating system, which serve as the I/O processor and maintenance subsystem. It also contains a board for a small computer systems interface (SCSI) host adapter.

According to Jeffrey Beeler, an analyst at Dataquest, Inc. in San Jose, Calif., both OS/2 and the SCSI interface are critical for integration into accounts — for example, in the banking industry — that necessitate interoperability with platforms such as the IBM Personal System/2.

Although the company referred to the Micro A as a desktop mainframe, Neil Waddington, vice-president of corporate marketing and services, said that "the Micro A will not be used on the desk top because it can support up to 16 users," or three programmers developing applications with Linc, the company's fourth-generation language (4GL).

According to Waddington, approximately 65% of the systems will be sold with Linc, which will bring the total system cost to approximately \$50,000. Mapper, the company's other 4GL, will reportedly be available in the second half of this year.

Eric Thomas, director of information systems and services at Lincoln Hospital in Phoenix and an A10 Model F user, called the price of the Micro A with Linc phenomenal because it will allow Linc programmers "to develop their little hearts out without impacting mainframe users." But Thomas said that he will not buy a Micro A until applications software for nursing stations becomes available.

The paucity of applications, however, could militate against Unisys' attempt to pit the Micro A as a weapon against IBM's formidable AS/400, said Peter Burris, an analyst at International Data Corp. in Framingham, Mass. The AS/400's applications number in the thousands.

FRENCH REVOLUTION.

And to cap it off, we gave them a high-performance database management system. One that lets everyone share information fast so systems management flows more smoothly.

Of course their success is part of Prime's success. We're a Fortune 500 company with annual revenues of more than \$1.5 billion.

If you'd like to know more about how Prime can help your business become a cause célèbre,

just call 1-617-275-1800 ext. 5490
(In Canada, 1-800-268-4700).

Prime. Vive la révolution.

 **Prime**

Prime Computer, Inc.

Prime and the Johnson & Johnson Family of Companies are proud co-sponsors of the PBS series NOVA.

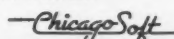
NEW! NEW! NEW!

MVS/Quick-Ref™

**The On-Line
Programmer's
Reference**

Instant access, from within any ISPF panel, to a concise summary of **NEW MVS** reference materials:

- MVS Utilities, Messages & Codes
- JCL Syntax for MVS/SP, XA, ESA
- TSO Command or CLIST Syntax
- IBM S/370 Reference Summary
- Quick DASD Freespace Lookup
- Over 44,000 lines



(312) 525-6400





"ISDN will allow us to
get rid of our network
spaghetti and concentrate
on selling hamburgers."

McDonald's faced a challenge. They were spending too much time and resources maintaining 21 different communications networks, rather than on what they do best: selling hamburgers.

And McDonald's is growing at the rate of one new restaurant every 17 hours.

As Bonnie Kos, McDonald's VP for facilities and systems, put it, "We had to adapt a single approach to all our communications that not only got rid of all our network spaghetti, but allowed us easy connectivity and communications between computers that use different protocols."

The approach they chose was ISDN.

Ameritech's Illinois Bell, in conjunction with AT&T Network Systems, and using a 5ESS[®] switch, used ISDN to allow McDonald's to migrate to a single, integrated, all-digital network.

So now, McDonald's sends integrated voice and data over an ordinary telephone line. Turning every work station into an information center, while minimizing costs and gaining greater network control.

But, the advantages of ISDN go beyond simplifying and connecting McDonald's communications network.

ISDN will soon allow the company to access more current market data, quickly track product promotions, streamline inventory control and reduce administration workloads. All this means more time to spend one-on-one with the most important part of McDonald's business—the customer.

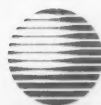
Even now, McDonald's is using such advanced ISDN features as calling number identification, electronic directory, and high-speed, high-quality facsimile transmission without dedicated lines.

As Bonnie Kos summed it up, "ISDN is letting us do a lot more with a lot less."

The Future's on the Line.

At AT&T, we believe that's where the future lies for every company—doing more with less. ISDN helps accomplish that today and helps pave the path to a larger vision: Universal Information Services—a world of services available on demand.

© 1988 AT&T



AT&T

The right choice.

ANNOUNCING



The New Standard
in Portable
Applications Development
for
High Performance
SQL Applications

PASSPORT was developed by FORTEX to provide the application developer and end-user with a high level language and extensive non-procedural capabilities to greatly accelerate development. For high performance, the resulting applications consist of compiled C code, portable across PC, mini and mainframe environments

and RDBMS. Currently available for VAX/VMS, SUN/UNIX, running ORACLE and SYBASE. VAX/RDB/SQL, OS/2 & MS-DOS, AS/400, MVS/DB2 and UNISYS 5000-6000/UNIX soon to be released.

To receive further information call
516-567-2003.

FORTEXSM

Passport is a trademark of Fortex Corporation. Fortex is a service mark of Fortex Corporation. Other product and brand names are trademarks and registered trademarks of their respective companies and are used for identification purposes only.

Japan chip plans include 64-bit RISC

IDG NEWS SERVICE

TOKYO — Two of Japan's giant electronics firms announced this month commercial plans for new microprocessor developments.

NEC Corp. announced the development of a general-purpose 32-bit microprocessor capable of up to 15 million instructions per second (MIPS) and features an internal clock speed of 45 MHz. Matsushita Electric Industrial Co. said it has developed a 64-bit reduced instruction set computing (RISC) "super-chip," for use in parallel processing.

NEC researchers employed a "silicidate technique," which decreases electrical resistance in the circuit, to integrate 385,000 micro devices on an 8.34mm by 8.28mm chip, according to a company spokesman. Sample shipments of the low-end version running at 33 MHz and processing 11 MIPS are expected to be available this fall.

Matsushita said it will release specifications of its new chip in February at the International Solid-State Circuit Conference '89 in the U.S. While Digital Equipment Corp. and General Electric Co. are also expected to announce similar chips then, the Japanese consumer electronics firm is looking to get a jump on superchip competition by starting commercial production of 32-bit RISC chips now.

Friday 13th worm gets DEC vaccine

BY MICHAEL ALEXANDER
CW STAFF

While several companies in the U.S. and abroad were reportedly struggling to quash the newest strain of Friday the 13th virus that hit computers a couple of weeks ago, Digital Equipment Corp. engineers were chasing down a worm.

Unlike a virus, which must attach itself to a program to execute, a worm can replicate itself, often to the point of overloading a computer's memory until it can no longer function.

A company spokesperson said that a worm was put into DEC computer systems the evening of Friday, January 13. "The systems manager noted the worm almost as soon as it came in," said Nikki Richardson, a company spokeswoman.

While the worm did not disable any of its systems, DEC engineers uncoupled some connections between systems while they concocted a vaccine to stamp out the worm. The vaccine, which was designed to follow the worm's trail, cleared the affected systems of the worm by Monday morning, Richardson said.

DEC officials refused to speculate on the origin of the worm or to reveal how many systems were affected or where they were located. "It's an internal investigation, and it will be finished when it is completed," Richardson said.

Korea sees chip sales doubling

IDG NEWS SERVICE

SEOUL, Korea — The Koreans are finally coming.

With the U.S. semiconductor industry still reeling from Japanese competition, the major South Korean semiconductor makers are setting aggressive export targets this year.

Samsung Electronics Co., Goldstar Semiconductor Ltd., Hyundai Electronics and Daewoo Telecom Co. have set an ambitious semiconductor sales goal of approximately \$2.65 billion for 1989, almost double the size of last year's sales of \$1.4 billion.

A local industry analyst said that thanks to the expanding global semiconductor market, particularly in Southeast Asia, all four vendors have increased their production capacity of 1M-byte dynamic random-access memory (DRAM) chips since last year.

With sales of almost \$1 billion in 1988, Samsung has set a 1989 sales goal of \$1.64 billion. The firm plans to sharply increase its 1M-byte DRAM manufacturing capacity to 5.5 million units per month from the current 1.5 million with the completion of its 1M-byte DRAM production line early this year. It also plans to increase efforts to make 1M-byte static

random-access memory chips.

Goldstar said it expects to ship \$534 million worth of memory chip and application-specific integrated-circuit products this year, almost triple its total 1988 export sales.

Chip sales for Hyundai Electronics are expected to reach twice that of its 1988 chip sales of \$223.9 million. The company will rely on the production of 256K-byte DRAM chips and is expected to start mass-producing 1M-byte DRAM chips in the second half of the year.

Daewoo Telecom shipped \$5.3 million worth of semiconductor products last year and plans this year to sharply increase shipments to \$29.1 million, with a target of \$10.9 million from overseas sales.

Introducing CICS RADAR



■ Policing CICS region outages is a time-consuming, costly process for you, the CICS systems programmer. But now with a new product from Compuware, experienced leaders in system software solutions, you have a new weapon to add to your arsenal: CICS RADAR. With RADAR you can reduce the time it takes to debug system dumps by up to 90%!

CICS RADAR automatically pinpoints the exact location of CICS region failures, regardless of the number of regions, task activity, or stress on the system. Then RADAR produces a report that tells you what happened. You can review the report online, or print it for future reference. RADAR even provides fully menu-driven, interactive access to a compressed and formatted system dump at the touch of a key.

CICS RADAR also helps to prevent future outages with its exclusive "Snapshot"

feature. This allows you to perform a complete analysis of any CICS region, before it fails, helping you to guard against unforeseen problems. And CICS RADAR is compatible with the Compuware Command Center.™

If you need speed and control in your fight against CICS region failures, call Compuware today about a free 30-day CICS RADAR trial. Compuware Corporation, 31440 Northwestern Highway, Farmington Hills, MI 48018. (800) 521-9353. In Michigan, call (313) 737-7300.

 **COMPUWARE**
Because experience is everything.

CICS RADAR is a trademark of Compuware Corporation.
© 1989, Compuware Corporation.

EDITORIAL

Paying the piper

WHAT ONE HAND gives, another can easily take away. In the wake of the U.S. Supreme Court's affirmation of states' rights to tax interstate communications traffic, businesses stand to lose a substantial amount of the interstate rate savings that divestiture of the Bell System has produced.

So, what can you do about it? Swallow hard and get ready to pay up.

About a dozen states either have or are considering tax measures to raise revenue from communications links. With reports popping up continually about another state facing a budget deficit, this is going to be an easy one for governors and state legislators to enact.

Relocating headquarters and branch offices is not a realistic alternative for most businesses. The growing trend among the 50 states to find "revenue enhancement" alternatives to income-tax hikes makes any relocation plan a risky gamble that could prove fruitless next week or next year when the taxman surfaces in the new locale.

For those businesses that are where they are because they *have* to be there, it's time to start thinking about tax-rebate strategies. If two states tax the same communication, one or both is going to have to come up with a whole or partial rebate, to eliminate double taxation.

That's going to require paperwork on your part, but more important, it's going to call for up-to-date communications hardware and software capable of providing businesses with information to the most minute detail for both voice and data traffic. Finally, there is as much reason for applying information systems tools to voice traffic as there already is for data traffic; we may not like it, but the tax needs of the 50 states may finally bring the justification for full integration of the voice and data communications organizations of today's businesses.

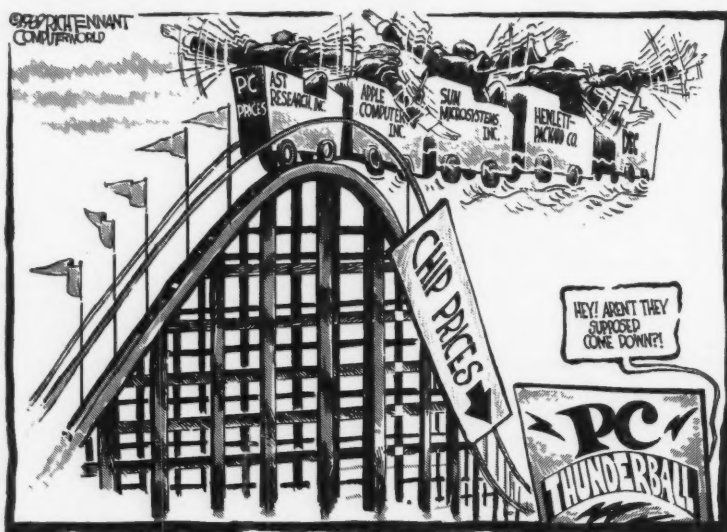
Going down?

Pity the poor microcomputer vendors. When memory chip prices went through the roof last year, they reluctantly raised system prices to compensate. "We have no choice," they said. "These prices are just eating us alive."

Not anymore. Chip prices are headed down — way down, if some predictions are to be believed. Already, volume prices are less than half of what they were seven months ago. But have PC prices come down yet? Well . . .

Few will argue with the rights of PC makers to earn a profit. But when vendors cloak their actions in the guise of market forces, they owe their customers an explanation when those forces change. At this point, all they have said about reducing prices is that they'll think about it.

If this explanation strikes you as inadequate, ask for a better one. If one is not forthcoming, consider letting your wallet do the talking.



LETTERS TO THE EDITOR

Cloning the Macintosh: A fruitless task?

I recently read Douglas Barney's editorial on the lack of a Macintosh clone (CW, Dec. 19) and thought you should know that there is one available today.

A low-cost Mac clone requires an Atari 1040ST, Mega 2 or Mega 4 computer with a monochrome monitor. Also required is a ROM cartridge and software called Spectre 128 (list price \$179.95) from Gadgets by Small and 128K-byte Mac ROMs (available for about \$150). A hard disk is optional. Also, a hardware/software package enables the Atari to read the Macintosh floppy disks.

This setup will not only run the color software written for the Macintosh II but all software that runs on the Macs with 128K-byte ROMs, also. And since the Atari computers use the Motorola 68000 CPU running at 8 MHz, the Mac software will run just as fast. Additionally, the Atari monitor is larger and has a slightly higher resolution than the Mac monitor.

Based on an Atari 1040ST (at least 1M byte of RAM is required), one should be able to assemble a Macintosh-compatible system at a cost below \$2,000.

G. McKendree Haynes
Ocoee Nuclear Station
Computer Services
Seneca, S.C.

I found Douglas Barney's editorial on cloning the Mac to be amusing, since it tells only part of the story.

While it is true that a Mac clone would be a welcomed addition, it is not true that buying a PC clone will save you money.

First of all, the Mac is not slow. True, the program startup is slower than a PC because of

the things the program must do at the beginning; however, just about everything else is faster.

It is costing you tens of thousands of dollars a year more in lost time to use a PC instead of a Mac. Think about that the next time you are congratulating yourself for sticking with a PC.

And while you PCers are trying to get Presentation Manager to work (to bring yourselves up to where Apple was in 1985), rumor has it that Apple is going to announce new computers in 1989. This will mean that for a few thousand dollars more, you can drive your Mac Corvette or your PC Hyundai. The choice is yours, but which users do you think will move ahead in the company?

Ron Howe
Sr. Database Designer
Computer Task Group
Raleigh, N.C.

In response to Douglas Barney's article, I suggest he take a look at the Amiga 2000 for a system with the qualities of the Apple Macintosh and the value of an IBM PC AT clone.

While it has a mouse-driven windowing user interface similar to the Mac, the Amiga comes with a full-function keyboard for those who would rather not depend on a rodent to get their work done. And since every Amiga is equipped with graphics coprocessors to off-load the screen-drawing function from the CPU, the Amiga is not as sluggish as the low-end Macs.

The Amiga not only offers this value, it also offers the software and hardware compatibility of an AT clone, so you can keep your PC software when migrating to more versatile and power-

ful Amiga applications.

Finally, Amiga offers multitasking with hundreds of application programs that work well under its environment. Cranking up your word processor while working on a spreadsheet is as simple as point and shoot.

Kevin M. Rahe
Comstock Park, Mich.

Douglas Barney calls for the wimp clone makers to dig in there and clone the Macintosh.

There are several flaws in his theme. The most obvious one is right there in the column, "as long as they don't steal the BIOS code." The most important thing about the Mac is the equivalent of the BIOS code, the copy-right protected ROM code that provides the unity that makes the Mac so easy to use.

The Macintosh was created by people who were dedicated to the desktop personal computer. They developed a machine that created desktop layout; it has taken years for it to creep into the IBM world, where it only works well on high-end machines with high-end displays. IBM still probably does not believe in microcomputers as real machines.

Sometimes people really do make a unique product instead of something differentiated only by advertising, and market forces drive the price up.

Mike Firth
Dallas, Texas

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

Has anybody seen a few desks floating around?

MICHAEL COHN



The first thing I asked myself Monday morning as I went in search of my new office was why did I wear

my best suit.

Just a week before, I had been stunned when the memo came across my desk. I was expecting to see another "We've postponed the recently postponed relocation of the Computer Center to the new building. We'll keep you posted as to when we postpone it again" message.

But instead, the three-sentence memo took us all by surprise: "The Computer Center move will occur this weekend. All programming staff should have their terminals, furniture and moving boxes labeled and secured by 5 p.m. Friday. Please contact the operations manager for additional information."

I don't handle Monday mornings all that well, anyway. But when I came in and found the as-

AT 4 P.M., there was still no news from the furniture front, and everyone had resorted to making little piles of books and papers on the floor.

sortment of boxes, terminals and cables creatively sprawled on the floor of my new office, I immediately wondered whether it would be worth it to go home and change clothes or maybe just go home.

A few doors down, I found the office of my programmers. Ron was already acclimating to his surroundings. He was preoccupied with breaking down his moving boxes and trying to stack them flat in the corner. Regrettably, he had not completely emptied them first. Ron seemed a bit upset.

"I knew this would happen," he moaned. "They lost two of my boxes. And look, no furniture — no desks, no chairs, no credenzas. Where am I supposed to put my stuff? And who knows when they'll get around to getting the system up."

I noticed that Ron's terminal was turned on, sitting right in the middle of the floor. The image of Ron lying on his stomach and banging on his keyboard

Cohn is a quality assurance representative based in Atlanta.

didn't surprise me. I figured I'd better get back to my office and call operations before things got out of hand.

By the time I unpacked my phone, discovered a working phone jack and got through to the operations manager, it was nearly 11:30 a.m.

"What's going on here?" I asked. "It's almost lunchtime. We have no desks. And the system's still down. I've got to run a cycle tonight. What's the story?"

"Look, I'm doing everything I can, OK?" he answered. "I've got people complaining because I lost some of the desks. Then they're complaining because I lost some of the production tapes. If everyone would be a little patient, I could straighten the whole thing out."

"You lost production tapes?" Things were getting worse by the minute. "How much did you lose?"

"Heck, probably less than 1%. Just the first 18 or 20 feet from every reel. But I'll take care of it. It's not like we didn't back everything up to cartridges. Locked them all up in a couple of desk drawers."

"Are those the desks you've lost or the desks you've found?" I asked, only half joking.

"Well, it really doesn't make a difference, because no one knows where the keys are."

Sitting on the floor

At 4 p.m., there was still no news from the furniture front, and everyone had resorted to making little piles of books and papers on the floor. The system had come up long enough for us to slip in a few reporting jobs. I called the operations manager again to check that the output was printing somewhere. "The printers? Don't worry, they're running fine. We left them in the old building for now."

"Great," I said, "but how do I get the printout?"

"I already thought of that. We send a truck out there three times a day. In fact, the third one left just 20 minutes ago to look for the first two trucks."

I was pretty fed up. "Look, I don't mean to complain. I know you have a tough job. But didn't you have this thing scheduled for weeks? Didn't we have walk-throughs? Recovery tests? File backups? Would it be too much to ask to get a desk or two over here as soon as you find all your tapes, printers and disk packs?"

"Disk packs? No one said anything about moving any disk packs."

I heard a loud crash in the background. The phone suddenly went dead. It looked like it was going to be a long night.

How to succeed as a manager

DENNIS NOONAN



It was scary when I first got promoted to management. I had read the *Peter Principle* and was fearful that I would be incompetent as a manager.

When I admitted my doubts to a neighbor, Joe, he told me not to worry. "Trust me," he said. "You can't be any worse than most of the so-called managers out there. You'll be fine. Just don't let them see you sweat." Joe was a management consultant, so he always spoke with authority. It was easy to believe him because he always told you what you wanted to hear.

Clearly, my strategy of "creative incompetence" had failed. Despite my squishy shoes, tweedy sport coat and randomly matching socks, here I was, a project manager with seven project members to lead down the path toward excellence. Somehow the system had failed. I should have been passed over. Joe said that my strategy probably failed to take into account how the others were dressed.

Incompetency principle

The *Peter Principle* was a crucial book for me. The author pointed out that competent people keep getting promoted until they reach a job that exceeds their ability. In a bureaucracy, incompetence is viewed as a barrier to further promotion, not grounds for termination. Thus, incompetent managers are doomed to remain in place, making themselves and everyone else miserable.

I had seen it happen myself when one of the programmers or systems analysts got promoted. In the beginning, there were well-wishes from former fellow workers. The promotee vowed to help make a better world. For a few months, the new manager continued to associate with former peers. Advice and feedback were solicited. And the work world seemed to be a better place. This feeling lasted until the first big crisis.

Leadership engenders piles of paperwork. The technical skills that got the executive promoted do not help in coping with the administrative demands of boss-hood. The new manager quickly realizes he has not been prepared for this role. He sees that there are two distinct worlds: theoretical and real. All the educational information is theoretical. All the problems are real.

Noonan is a free-lance writer based in Wellesley, Mass. He was formerly a project manager at a minicomputer maker in the Boston area.



JUDY LOVE

Time, the scarcest resource of management, becomes too precious to be squandered on nonpriority activities. Inevitably, the boss' attitude shifts from affiliative to aloof. Lunches with the old gang and visits to the local watering hole dwindle. When the new boss does attend these gatherings, the conversation is dominated by concerns with status, issues, plans.

A silent wall forms between the executive and former co-workers. He thinks they take advantage of his friendliness. They think he is changed, distant, carried away with his own importance. Eventually, the term "incompetent" is tossed around. It is an unpleasant turn of events — the fate I sought to avoid by evading promotion.

Faking it

I was successful for several years. The *Peter Principle* offered advice to those who felt they had achieved the last level of competence. The prescription suggested that the person who did not want to be promoted should pretend to be unfit for the next level. You do things that will make your managers question your competence, while your peers and associates still think you are effective.

It seemed like a foolproof strategy to me. But now I had to face up to the fact that my strategy had failed and I would have to make the best of it.

My new boss, the systems manager, had been recently promoted himself. He was the direct type — direct to a fault. He started out telling me that I was not his first choice for the job but

my seniority had been an unavoidable factor in his decision. I was sure that this was just a pep talk to keep me on my toes in my new position of authority.

The systems manager told me that I had inherited some "problem people." My first problem was to try to figure out which ones they were. They all seemed to understand what they were supposed to do, and they kept turning in great work. Oh sure, there were a couple of weirdos on that team, but I figured, heck, this is systems, not sales.

My incompetence as a manager really came to the surface when I discovered that each of these people knew more about programming than I did. In fact, the only contribution I could make was to hammer away at the project milestones and restate the goals and deliverables in simple terms. All I had to do was point them in the right direction. Soon I had gotten into the habit of leaving them alone unless someone wanted to chat or show me what he had been up to lately. These folks were like kids, so proud of themselves.

Helpful feedback

They were getting results, too. The users were always calling and telling me what a great job we were doing. I passed these remarks on to the systems manager, but he "wasn't interested in the opinions of nontechnical people." He was much more concerned with the fact that one of my status memos had three typos, and how did that make us look?

Continued on page 22

Manager

CONTINUED FROM PAGE 21

My management consultant friend had been dead wrong. I was not doing fine. As a manager, I was incompetent. Sure, good things were happening, but I wasn't making them happen. It was them, not me. When the vice-president complimented me in writing, my systems manager hastened to point out that the team had done all the excellent work, and I should not acquire a big head.

On my next review, the successes of my team were attributed to having an exceptionally competent staff. My accomplishments as a manager were deemed "adequate." Most of the review was de-

voted to a discussion of the systems manager's views on standard methodologies and the leadership role of MIS in the strategic planning of the company. It was clear that I had failed to measure up to his standards of excellence.

He thought I should become more technical so that my programmers wouldn't be able to fool me, and that I should become more demanding on my team members and be more influential over my peers. He also noted that I had to be prodded to turn in monthly status reports on time.

Moreover, I had shown what he called disdain for traditional systems development methodologies. Although the systems seemed to work and the users were happy, many of my team members were

remiss in ensuring that the documentation group was provided with the latest commented code. My systems manager was not amused by the sign on one programmer's door that read, "Documentation is for sissies."

A pushover

In time, I became convinced that I had failed to grasp the essence of managing people in a systems development environment. I was too trusting, too easygoing. And although the results seemed valuable to me, my manager was clearly unimpressed. Eventually, our relationship deteriorated to the point at which I had to look for another job. I got a lucky offer from a big high-tech company as a project manager.

I decided not to repeat the mistakes of the past. This time, my neighbor Joe advised me on my wardrobe. I got a couple of dark suits, a power tie and expensive shoes. He made me buy all-white shirts.

I became the first project manager to turn in a monthly status report. Sure, I inherited a few people problems, but I straightened them out fast. The programmers took some technical courses, and there was a lot of turnover because of my high standards.

My boss thought I was doing fine, but the users were unreasonable. They just didn't seem to realize the importance of good, readable documentation and flowcharts. They kept calling to ask me why their systems weren't done yet. But I figured, heck, you can't satisfy everybody.

WE'VE JUST ELIMINATED THE ONE MAN WHO'S STOOD BETWEEN YOU AND THE WORLD'S MOST POWERFUL EIS.



Introducing the EIS/Generation Series from Pilot: Full EIS capability without the big support bills.

Announcing EIS/G, the industry's first series of EIS code generators. This new technology can reduce your EIS development and support costs by up to 80%. And you won't need a programming staff to implement powerful EIS systems. Pilot's experience with leading corporations will also ensure that your executives will have proven and effective EIS functionality. Code generation means you can have it at a fraction of the overall cost.

Put EIS/G to the test. Call us at (617) 350-7035 to arrange a one hour demonstration at your office. We'll show you EIS in a different shade of green.

PILOT

EXECUTIVE SOFTWARE

40 Broad Street Boston, MA 02109

BOOKS IN BRIEF

Disaster Recovery Planning

By Jon William Toigo

Managing risk — or catastrophe, in which risk turns into disaster — in information systems, complete with a pullout flowchart showing emergency decision-making at each stage of a disaster recovery.

Hardcover, 267 pages, \$45, ISBN 0-13-214941-9, by Prentice Hall, Englewood Cliffs, N.J.

DB2: Maximizing Performance of Online Production Systems

By W.H. Inmon

An experienced writer on databases tells how to create DB2 structures, design and load DB2 tables, run applications and maximize performance.

Paperback, 369 pages, \$39.95, ISBN 0-89435-256-3, by QED Information Sciences, Inc., Wellesley, Mass.

IBM's Local-Area Networks

By W. David Schwaderer

A senior programmer in IBM's Storage Systems Strategy and Architecture Development offers a straightforward guide to IBM Personal Computer LAN implementation.

Paperback, 294 pages, \$29.95, ISBN 0-442-20713-1, by Van Nostrand Reinhold, New York.

Network World's Teletoons

The editors of *Network World* present the comic side of communications in the teletoons drawn by Phil Frank and Joe Troise, the weekly newspaper's regular cartoonists.

Paperback, 52 pages, \$9.95, by Network World, Framingham, Mass.

The Computer Virus Crisis

By Philip Fites, Peter Johnson and Martin Kratz

The prevention and cure of computer viruses — as timely a subject as there is currently in the computer industry — is covered in this very readable short paperback.

Paperback, 171 pages, \$19.95, ISBN 0-442-28532-9, by Van Nostrand Reinhold, New York.

Publishers wishing to have their books considered for review or excerpting can direct books, prepublication galleys, press releases, catalogs or other information to George Harrar, Features Editor, *Computerworld*, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

APPLE TURNS 030 030.

The time was ripe. Apple[®] was planning their most advanced Macintosh[®] SE and Macintosh II computers ever. So it was only natural that they turn to Motorola's 68030 32-bit microprocessor. Twice.

After all, Motorola's 68000 family has been instrumental in helping Apple develop its consistent, intuitive graphics workstyle, which has revolutionized the way people communicate with computers. And now, the 030 is making that workstyle even more versatile and powerful than ever.

The new Macintosh SE/30, based on a 16MHz 030 along with Motorola's 68882 math coprocessor, delivers up to 4X the performance, and in floating point calculations can deliver up to 100X the performance, of the Macintosh SE. What's more, it features a new expansion slot called, astutely enough, "030 Direct". This not



only provides direct access to the 030 to increase performance and flexibility, but also allows third parties to extend the Macintosh SE/30's capabilities with a whole range of expansion cards.

The recently introduced Macintosh IIx also uses the 68030 and 68882 to

great advantage. In fact, 030 firsts like on-chip data and instruction caches and built-in Page Memory Management Unit streamline the Macintosh IIx architecture, and enable every Macintosh IIx to run Apple's AUX[®] advanced multitasking operating system.

So if you want to build your most advanced system ever, put an 030 at its core. For free benchmarks and more information, call or write Motorola Inc., P.O. Box 20912, Phoenix, AZ 85036 1-800-441-2447.

It could be the smartest pick you ever make.



MOTOROLA

Our seminar shows you how the power of INGRES puts information at your fingertips

Only INGRES Relational DBMS and 4GL give you the solutions you want on the computers you use

If you're in charge of MIS, or are involved in the evaluation and selection of a data-base system, here is your opportunity to learn about the most advanced integrated Relational DBMS and 4GL ever.

In just a few hours, you'll know more about how to evaluate today's systems than you ever knew before. Because, after that, you'll be comparing all other systems to INGRES's Total Performance Architecture™.

Total Performance Architecture (TPA) combines Tools, Power, and Access for applications development, transaction processing, and seamless information access. INGRES can be implemented transparently across over 40 hardware and operating system platforms including DEC, IBM, and UNIX, from mainframes to PCs.

TOOLS



Minimize backlog and cost with 4GL Application Development Tools.

INGRES's powerful 4GL tools help a major consumer products company save on applications development costs. INGRES has the only full-function 4GL tools which are tightly integrated with our SQL RDBMS and are instantly portable across PC, UNIX, VAX, and IBM platforms. INGRES visual programming methods facilitate rapid prototyping and modification.



Access information faster and easier with INGRES Query and Reporting Tools.

INGRES Query and Reporting Tools are used by a telecommunications company. INGRES reduces the learning curve with easy-to-learn, "fill-in-the-form" interfaces which allow direct access to critical information. INGRES SQL also interfaces with popular programs like Lotus 1-2-3, so users can leverage existing knowledge to become productive right away.

POWER



Support OLTP applications with the INGRES Multi-Server™ Data Manager.

The INGRES Multi-Server Data Manager is the only Relational DBMS to provide scalable OLTP performance across single, clustered, multi-processor, or networked CPU configurations. With its unique AI-based Query Optimizer, INGRES helps one of the world's leading business and consumer electronics companies vastly improve overall system performance.

ACCESS



Apply INGRES RDBMS power to older file management systems with INGRES Gateways.

INGRES Gateways give a pharmaceutical company direct access to data trapped in an older file system and the ability to combine that data into new relational applications. INGRES Gateways allow access to data across different file formats (such as dBASE III and RMS). No other relational database offers these instant links to older data files.



Integrate islands of information into a distributed resource with INGRES/STAR.

Using INGRES/STAR, an international financial giant links information systems in the United States, Europe, and Japan. INGRES/STAR provides the most advanced distributed database management system available today and improves access while reducing complexity and costs for hundreds of applications from the shop floor to the board room.

Through technical presentations, case-studies, and live demonstrations, you'll see how the features of each INGRES product meet the challenges of today's MIS department from applications design and prototyping through implementation and maintenance.

We'll present specific case-studies showing how INGRES has served the needs of thousands of companies worldwide by improving development productivity by a factor of five, reducing life cycle maintenance costs, and providing true applications portability.

So, if you're a decision-maker involved in evaluating and selecting database systems, come and see why Fortune 500 companies worldwide are using INGRES to meet their MIS needs.

U.S. SEMINARS

CA
Los Angeles Feb. 8
Mar. 14
San Francisco Feb. 9
San Diego Feb. 14
San Jose Feb. 7
Mar. 15
CO
Denver Feb. 8
CT
Hartford Feb. 22

DC
Washington Feb. 9
Mar. 17
GA
Atlanta Feb. 7
IL
Chicago Feb. 2
Mar. 23
IN
Indianapolis Mar. 14

MA
Burlington Mar. 23
Cambridge Feb. 2
MI
Detroit Feb. 21
MN
Minneapolis Feb. 15
MO
Kansas City Feb. 23
St. Louis Feb. 16

NC
Raleigh Feb. 23
NJ
Princeton Feb. 14
Saddle Brook Feb. 8
NY
Albany Feb. 15
New York City Feb. 21
OH
Cincinnati Mar. 23
Cleveland Mar. 8

OK
Tulsa Feb. 9
OR
Portland Feb. 22
PA
Philadelphia Mar. 23
Pittsburgh Mar. 8
TX
Dallas Feb. 7
Houston Feb. 14

UT
Salt Lake City Feb. 16
WA
Seattle Mar. 14
WI
Milwaukee Feb. 16

CANADIAN SEMINARS

ALB Toronto Feb. 9
Calgary Mar. 14
BC Vancouver Feb. 7
ONT Montreal Feb. 2
Ottawa Mar. 9
Quebec City Mar. 8

To register, call toll-free (in the U.S. and Canada) at:

1-800-4-INGRES (1-800-446-4737)

ASEM840CW

INGRES

RELATIONAL TECHNOLOGY

1080 Marina Village Parkway, Alameda, CA 94501

© Relational Technology. Registered trademarks: IBM (International Business Machines Corporation), VAX, RMS (Digital Equipment Corporation), UNIX (AT&T), LOTUS 1-2-3 (Lotus Development Corporation), dBase III (Ashton-Tate Corporation). INGRES Total Performance Architecture, INGRES Multi-Server are trademarks of Relational Technology. Printed in U.S.A.



Reading someone else's copy of Computerworld?

YES, I want to receive my own copy of COMPUTERWORLD. Please send me 51 weekly issues for only \$39.00* — just 76¢ per copy. In addition, I'll receive FREE bonus issues of COMPUTERWORLD FOCUS.

First Name	MI	Last Name
Title		Company
Address		
City	State	Zip

Address Shown: ☐ Home ☐ Business

Basic Rate: \$48

* U.S. Only. Canada \$110, Central/South America \$135, Europe \$195 (Airmail), all other countries \$295 (Airmail). Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

E4904-5



Reading someone else's copy of Computerworld?

YES, I want to receive my own copy of COMPUTERWORLD. Please send me 51 weekly issues for only \$39.00* — just 76¢ per copy. In addition, I'll receive FREE bonus issues of COMPUTERWORLD FOCUS.

First Name	MI	Last Name
Title		Company
Address		
City	State	Zip

Address Shown: ☐ Home ☐ Business

Basic Rate: \$48

* U.S. Only. Canada \$110, Central/South America \$135, Europe \$195 (Airmail), all other countries \$295 (Airmail). Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

E4904-5

1. BUSINESS/INDUSTRY (Circle one)
 10. Manufacturer (other than computer)
 20. Finance/Insurance/Real Estate
 30. Medicine/Law/Education
 40. Wholesale/Retail/Trade
 50. Business Service (except DP)
 60. Government — State/Federal/Local
 65. Communications Systems/Public Utilities/Transportation
 70. Mining/Construction/Petroleum/Refining/Agric.
 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
 90. Computer/Peripheral Dealer/Distributor/Retailer
 75. User: Other _____
 85. Vendor: Other _____
2. TITLE/FUNCTION (Circle one)
 19. MIS/DP MANAGEMENT
 19. Vice President, Asst. VP
 21. Dir., Mgr., Suprv., IS/MIS/DP Services
 22. Dir., Mgr., Suprv., of Operations, Planning, Admin. Services
 23. Dir., Mgr., Suprv., Analyst, of Systems
 31. Dir., Mgr., Suprv., of Programming
 32. Programmer, Methods Analyst
 33. Dir., Mgr., Suprv., OJ/WP
 38. Data Comm. Network/Systems Mgt.
 - OTHER COMPANY MANAGEMENT
 11. President, Owner/Partner, General Mgr.
 12. Vice President/Asst. VP
 13. Treasurer, Controller, Financial Officer
 41. Engineering, Scientific, R&D, Tech. Mgt.
 51. Sales/Mktg. Mgt.
 - OTHER PROFESSIONALS
 60. Consulting Mgt.
 70. Medical, Legal, Accounting Mgt.
 80. Educators, Journalists, Librarians, Students
 90. Others _____
3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.
 - A. Mainframes/Supremes
 - B. Minicomputers/Small Business Computers
 - C. Microcomputers/Desktops
 - D. Communications Systems
 - E. Office Automation Systems
 - F. No Computer Involvement



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144



SYSTEMS & SOFTWARE

SOFT TALK

John Barnes

Let's jail the virus makers



In the last few months, the idea of computer viruses has exploded into the general media and thus into the mind of the man on the street.

Much to my surprise — maybe it's because word processors are now universal in journalism and so journalists take a keen interest in the topic — reporting has been pretty good.

There is an exception, though. The media tends to portray the virus maker as a genius — usually a twisted, eccentric or egotistical genius — but basically a genius. If we can re-educate the public on this point, we'll have done a lot to stop viruses.

The computer virus maker is supposed to be clever, a brilliant fellow gone wrong. Tom Swift driven by the cruel, misunderstanding world to become Victor Frankenstein. In fact, it's well-known within the industry that most such people are boozes with an excessive need for attention they cannot attract through talent alone.

This hurts us in MIS. To begin with, it tends to make high-level policy people who are not computer-literate treat viruses

Continued on page 33

Expert systems: Quiet heroes

Away from limelight, artificial intelligence is effective in routine tasks

ON SITE

BY AMY CORTESE
CW STAFF

The term "expert systems" is increasingly misleading. Rather than replace an expert, more and more of these systems are developed to help all kinds of employees by handling routine chores.

At MCI Communications Corp., expert systems are used to "make everyday systems easier to use," according to Dan DeSalvo, a manager in the Ad-

vanced Technologies Group.

One expert application was designed to assist the many marketing and sales people within MCI who need an array of constantly changing customer and product information.

The Commercial Prospects Advisor was developed using Artificial Intelligence Corp.'s Knowledge Base Management System to simplify the task of querying a database. The result is that users at a terminal do not need to know whether the information lies in a database built

with Adabas or DB2.

The result has been to disseminate information more widely, according to DeSalvo, because an obstacle to users has been removed. Ultimately, the system will make more than one million records easily accessible to more than 1,000 users.

Furthermore, the Commercial Prospects Advisor took only five months to build and will be easier to maintain than a conventional application, DeSalvo stated. Emphasizing the application's ease of use, DeSalvo

points out that the only user manual is a 3-by-5 card detailing the logon procedure.

Down to earth

Tom Schwartz, president of AI market research firm The Schwartz Associates in Mountainview, Calif., concurs that artificial intelligence technology brings a down-to-earth benefit, boosting productivity and lowering costs.

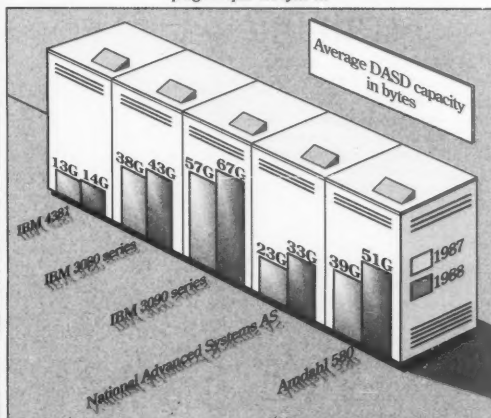
Because AI allows programmers to deal with problems at a high level of abstraction, it creates systems that are easier to develop and maintain than a program written in a procedural language such as Cobol. The rules-based design of expert systems

Continued on page 37

Data View

DASD growth across the board

Direct-access storage device capacity has increased the most on plug-compat[®]ible systems



SOURCE: COMPUTER INTELLIGENCE
CW CHART: FRANK C. O'CONNELL

DEC offers automatic watchdog

BY JAMES DALY
CW STAFF

MAYNARD, Mass. — Most systems managers would probably agree that if finances allowed, they would post a 24-hour guard at every computer site. Digital Equipment Corp. may have come up with the next best thing.

The recently introduced Environmental Monitoring System (EMS) is a microprocessor-based electronic watchdog that uses up to 112 external sensors to provide warnings against data-threatening abnormalities

such as fire, flooding, extreme temperatures, excess humidity or security breaches. The system can be used in place of security personnel to cut operations expenses, according to Sara Williams, DEC's environmental products manager.

The EMS surveillance system responds with a visual display and an audio announcement on its connecting terminal whenever real-time samplings of

Continued on page 37

Inside

- University of Illinois database builds body image. Page 29.
- DEC workstation rollouts add new dimensions to hospitals' radiology applications. Page 29.
- Cincom plans next Directions executive meeting for Miami. Page 29.

the totally automated office

The Next Generation in Office Automation

• Fully Customizable • Decentralized Administration • Full Connectivity • Integrated PC Support • Resource-efficient

Emc²/TAO is a QUANTUM LEAP FORWARD in ELECTRONIC MAIL AND OFFICE AUTOMATION.

Emc²/TAO is a dynamic system that gives Electronic Mail and Office Automation to everyone — from novice to expert. It can be tuned on an individual basis to suit the user's abilities and needs. Novices can start on day one with no training. Experts have everything they need. And, it has been designed as a platform to support an emerging set of capabilities as the evolution of office automation continues.

POWER THROUGH SIMPLICITY

Emc²/TAO provides hundreds of easy-to-use features for managing, organizing and distributing Electronic Mail and documents. Emc²/TAO includes electronic-mail, calendaring, document storage and retrieval, and a multitude of powerful bridges and gateways.

CALL NOW for more information. Toll-free: 800 237-4510. In Florida: 813-643-1500.

Emc²/TAO gives full control through decentralized administration. Authorization can be delegated by feature, by department or by logical class. And Emc²/TAO's user interface allows product features to be custom-tailored to suit the needs of each individual user or group of users, at the installation's discretion.

Emc²/TAO is simple, powerful, and allows unprecedented connectivity.

ALL ENVIRONMENTS

- MVS, MVS/XA
- VM/CMS
- VSE, SSX
- TSO, CICS, IMS, IDMS
- PCs (Personal Emc²)
- VAP (Special Emc² VTAM Application)
- FIVS (Fischer International Virtual System)

GATEWAYS

- PCs and LANs.
- SNADS.
- X.400.
- BITNET.
- DIA/LU 6.2 compatible devices and systems.
- Western Union services: (Telex, Facsimile, EasyLink, etc.)
- DISOSS.
- PROFS.
- DEC (VAX Mail, All-in-One).
- WANG (Wang Office).
- And more.



FISCHER
INTERNATIONAL
SYSTEMS CORPORATION



ELECTRONIC MAIL COMMUNICATION CENTER / TOTALLY AUTOMATED OFFICE

Emc²/TAO is the smart answer. Many of the largest corporations in the world have already selected Emc².

THE INTERNATIONAL PERSONAL COMPUTER COMMUNITY
November 11, 1986 Vol. 3, No. 11 Page 44-45

COMPUTER WORLD

M I C R O
B I T S

PC options aplenty at show

CW STAFF

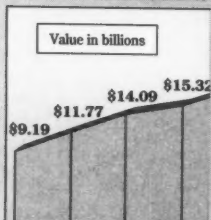
• A hardware and software produced specifically to design and business presentations is scheduled to woo PC users with pregraphics options, expansion cards and enhanced security features, deocassette recorders. The imucta, and has signed up

Data View

Program training

CW STAFF

Put a bunch of personal computer users in a room and eventually they will duplicate every application ever written for themselves



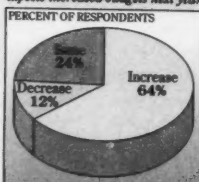
same time, they will create even their departments. At the formation center manager down the hall.

Thanks to the proliferation of personal computers and a rise in computer literacy, more end users than ever are creating applications, databases, spreadsheets and other programs. The appli-

NEWS

Get out the checkbooks

Survey of 240 information systems executives indicates large majority expects increased budgets next year



CW CHART

Imagine if

Computerworld had only one column.

Now you know why you need Micro Channel from IBM.

What if you were forced to deal with a heavy volume of information, every business day, exactly one item at a time?

Not an attractive prospect. And, fortunately, not a problem for Computerworld. But it's becoming one for many personal computers, because their design is limited.

That's why IBM developed the Personal System/2® computers with Micro Channel.™ Micro Channel gives the PS/2® more "columns" in which to handle the flow of information. Within your system. And between systems. Not piece by piece, but *simultaneously*. With a combination of speed and reliability that's truly newsworthy.

But there's more. With Micro Channel, you're always prepared to take advantage of late-breaking technology. For example, you can put multiple processors on your system, running

independently, yet still able to share important things like memory, disk storage and communications.

So you're ready to upgrade what you already have without shopping for a new system.

The IBM PS/2 computers with Micro Channel. Ask your IBM Authorized Dealer or IBM Marketing Representative about them. For a dealer near you, call 1-800-IBM-2468, ext. 115.

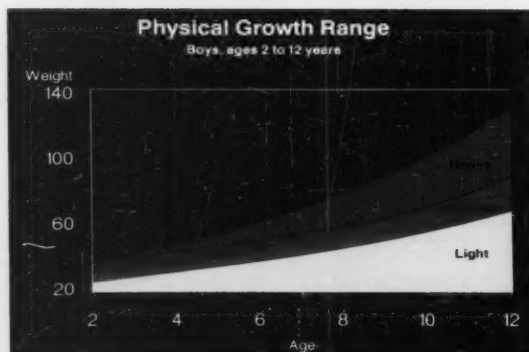
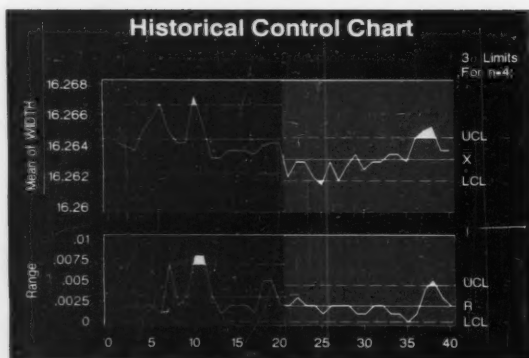
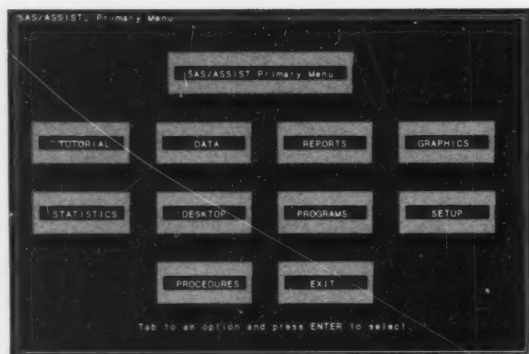
It may turn out to be the best business news you'll get all day.

IBM®



The SAS System

More Choices, for More Applications, than Any Other Software.



The SAS System is the software you'll never outgrow. No other software offers so many choices for data management, analysis, and presentation. For any user—new computer user to seasoned pro. For any environment—PC to technical workstation to minicomputer to mainframe.

Choices to Build On. Start with a powerful English-like language and essential data management tools. Then take your pick of ready-to-use applications: statistical and mathematical analysis...report writing and color graphics...project management and quality control... forecasting and decision support.

Or build your own menu-driven applications—quickly and easily—with the SAS System's interactive applications development tool. Even first-time users can command the power of the SAS System... just by filling in the blanks.

Choices to Count On. More than a million users throughout the world—in business, industry, government, science, and education—have made the SAS System their #1 choice for data analysis and color graphics. And every SAS System application is backed by expert technical support, documentation, and training.

We'll tell you more in a free 12-page executive summary. Just give us a call at (919) 467-8000. In Canada, call (416) 443-9811.



SAS Institute Inc.
Software Sales Department
SAS Circle ☐ Box 8000
Cary, NC 27512-8000
Fax (919) 469-3737

The SAS System runs under IBM Corp.'s MVS, CMS, and VSE; Digital Equipment Corp.'s VMS; Data General Corp.'s AOS/VS; Prime Computer, Inc.'s PRIMOS; Sun Microsystems, Inc.'s SunOS; Hewlett-Packard's HP-UX; Microsoft Corp.'s MS-DOS; and IBM Corp.'s PC DOS.

Copyright © 1988 by SAS Institute Inc. Printed in the USA.

Project Da Vinci: A medical database for modern man

ON SITE

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — Leonardo da Vinci, the artist and inventor of the Italian Renaissance, was thought by some contemporaries to be diabolically morbid. He spent a good deal of time not drawing from life but instead sketching cadavers.

His painstaking research of the dead, however, has brought tangible benefits to the living — Leonardo's work formed the basis for modern medical illustration.

And recently, Da Vinci the genius has inspired Project da Vinci, a \$2 million program at the University of Illinois at Chicago (UIC) that is building a three-dimensional database containing vast amounts of information on the human body.

The data, which is stored on a Control Data Corp. Cyber 930 mainframe, will contribute to two goals: the synthesis of a "Standard Man," or composite

of many different body types, and the effort to identify missing children by predicting how their bodies and facial features age.

"There's data specific to age,

ments of dozens of cadavers donated to medical research. As many as 100 cadavers may eventually be used to create the database.

The work parallels similar efforts under way at the University of Colorado and the University of Washington. According to UIC officials, the project is funded by such vendors as CDC, AT&T, Du Pont Co. and Procter and Gamble Co.

Although it is not expected to be complete for several years, the Standard Man database will allow users to summon up descriptions of human beings for medical and commercial applications.

Sadler said he anticipates practical applications in the areas of sports and rehabilitative medicine, clothing and shoe design, medical instruction and the engineering of military instruments.

The centuries-old art of medical illustration has not yielded to computerization until recently, according to Sadler.

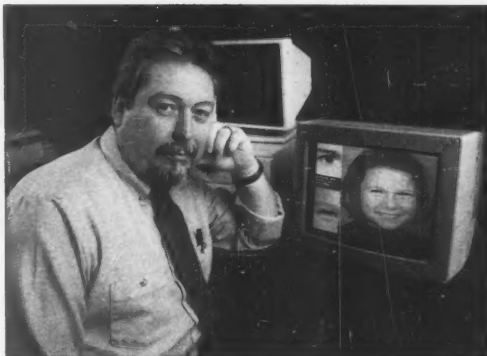
"For hundreds of years, peo-



Standard Man database

race and sex, so that we can summon up a picture of a human being across the range of the lifespan," said Lewis Sadler, a medical illustrator who heads the university's Department of Biocommunication Arts.

The data accumulating in the Cyber 930 is based on measure-



PHOTOS BY RICHARD DERR/PICTURE GROUP

UIC's Sadler anticipates practical medical applications

ple have talked about humans as belonging to a single species," he explained. "But researchers ended up specializing in smaller and smaller areas of study, and nobody was looking at the whole picture."

The old-fashioned way

Until now, medical artists such as Sadler and his 12 colleagues on the UIC faculty were forced to render all illustrations by hand.

For example, university illustrators have aided police in "aging" pictures of missing children in the hope of recovering them from noncustodial parents.

The aging technique, which

relies on the fact that facial dimensions change fairly predictably over time, has helped recover 24 of 81 children during the last three years.

However, it is extremely painstaking work. "It used to take 20 hours to 'age' one child," Sadler reported. "Now, we can do it in minutes."

Hand-drawn work also suffers from some inaccuracy because of human error. "We felt we were very accurate if we were 87% accurate," Sadler said.

Not only does the use of computers increase accuracy, but data gleaned from cadavers is also far more precise than hu-

Continued on page 35

DEC's desktop helps automate radiology labs

BY AMY CORTESE
CW STAFF

Last week's torrent of desktop hardware and software unleashed by Digital Equipment Corp. left many scratching their heads. But as users begin to make sense of the announcement, some may find the products and capabilities that were

announced add new functionality to systems already in use.

The field of radiology is one that will benefit from DEC's new products. DEC has long offered application software to automate radiology departments in hospitals, but last week's announcement supplies the final pieces that will allow text and medical images to be integrated for the

first time, according to DEC officials.

Specifically, the pieces are Decwindows software, the Vaximage Application Services software tools and the desktop workstations in conjunction with Decrad, DEC's radiology software. Decwindows will be included in Release 5.1 of VMS, due out next month. However, a handful of early support customers have already been at work building systems.

A long way to go

Dr. Gilbert Jost, Chief of Diagnostic Radiology at The Mallinckrodt Institute of Radiology in St. Louis, said that, using the new DEC products and Decrad, his department has been able to integrate text and image in test demonstrations. Currently, images are mainly stored on film in the radiology department. Although he views the ability to integrate image on the same platform with text an important step forward, Jost acknowledges there is still a long way to go.

The DEC products reportedly will be integrated with other DEC or non-DEC components to form a picture archiving and communications system that stores, displays and distributes text- and image-based patient information. For instance, a radiology image could be displayed in one window while a text-based record containing patient information could be displayed in another.

An underlying part of this technology is software that converts images from a radiology-specific machine such as a CAT scanner to DEC Document Interchange Format (DDIF) protocols. By reducing text and image data to a common data type, the image-based data can be transmitted from the radiology machines to an Ethernet network of general-purpose computers. The conversion software is the result of a joint effort of DEC and Siemens Medical Systems, Inc., a subsidiary of Siemens AG.

Although general-purpose hardware will not replace radiology-specific machines, the common data format and DEC's Compound Document Architecture allow the lower cost workstations to do some of the work that used to require special-purpose hardware.

The Vaxstation 3100, DEC's new entry-level workstation, and the Vaxstation 3520 and 3540 workstations will be the most cost-effective models for a radiology system, according to the company.

The Decrad software — which runs solely on VMS operating systems — is priced from \$21,000 to \$100,000, depending on the hardware on which it runs. Although situations will vary, the company estimates that a sophisticated radiology department could be automated with a DEC system, including workstations and software, for about \$500,000.

SOFT NOTES

Cincom plans Directions conference

Cincom Systems, Inc. will hold its next Directions executive conference from Feb. 21-24 at the Hotel Inter-Continental in Miami. The conference is titled, "Directions in Manufacturing, Keys to World Class Performance in 1990." For additional information, contact Cincom at 800-543-3010.

Ardent Computer Corp. said it added four computational fluid dynamics software packages to its Tital line of graphics supercomputers.

The programs include the following: Omniplot and Usaero, both from Analytical Methods, Inc. in Seattle; Phoenix from Cham Ltd. in London; and Fidap, a flow solver from Fluid Dynamics International, Inc. in Evanston, Ill.

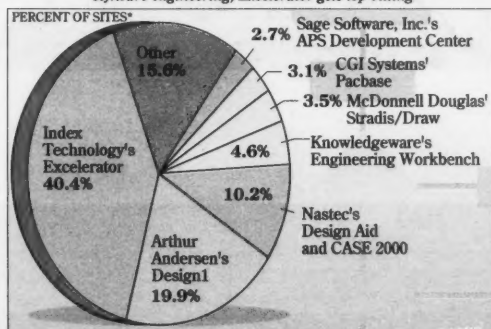
Business Systems Resources in Waltham, Mass., said it will adapt its Advance software to IBM's Systems Application Architecture (SAA) guidelines. Advance supports the information needs of college and university alumni and develop-

Continued on page 35

Data View

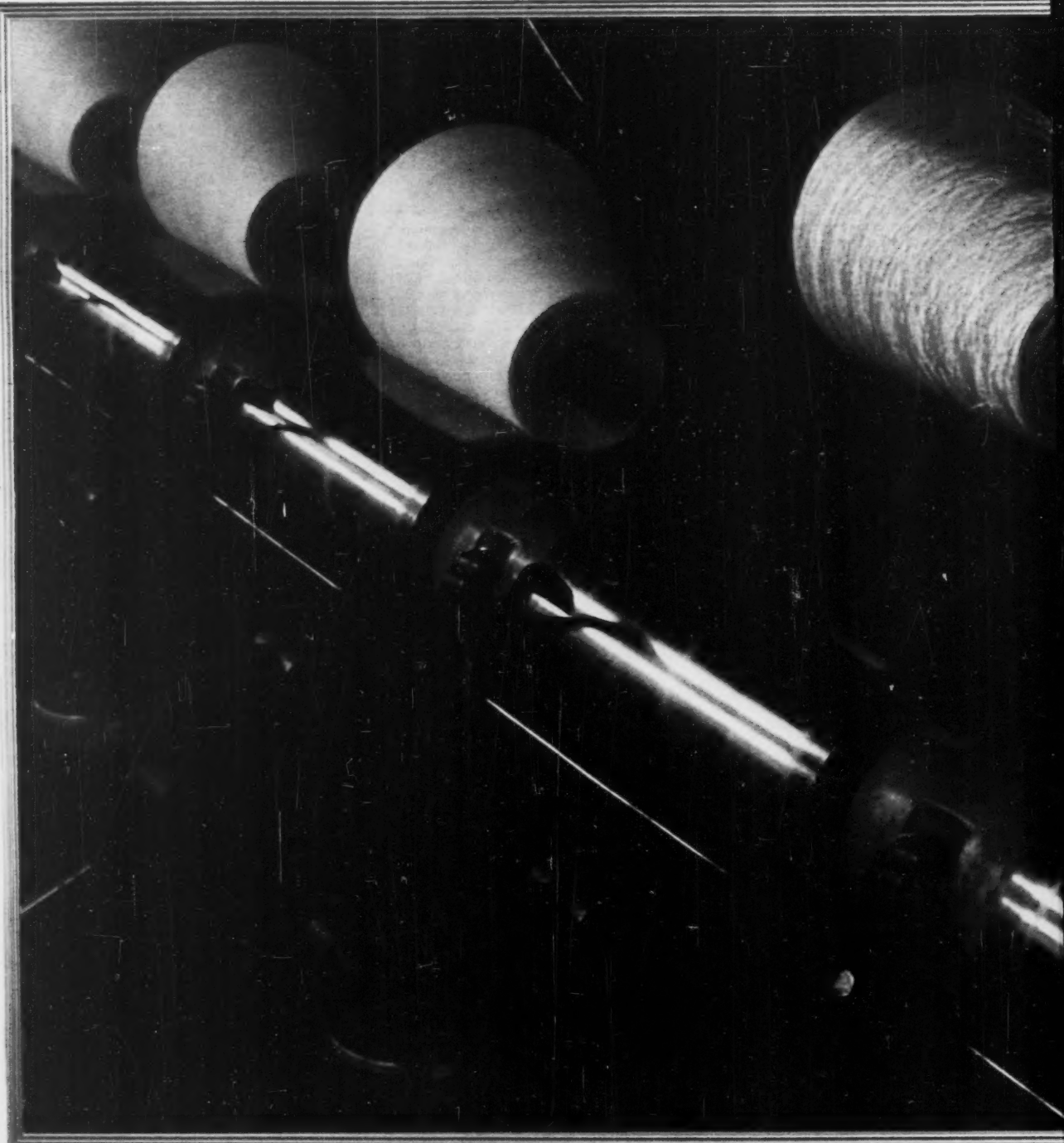
Top commercial CASE tools

Among mainframe sites using commercial products for computer-aided software engineering, Excelsior gets top billing




* Base of 445 U.S. IBM and plug-compatible mainframe sites

SOURCE: FOCUS RESEARCH SYSTEMS, INC.
CW CHART: JOHN YORK



© Digital Equipment Corporation 1988. The Digital logo is a trademark of Digital Equipment Corporation.



digital

"Digital's single architecture ties DuPont Fibers' manufacturing together and vastly increases our efficiency."

"To improve manufacturing efficiency and customer satisfaction and to stay #1 in the synthetic fibers industry, we undertook the most sweeping integration of manufacturing facilities in our company's history. We selected Digital's VAX architecture and Ethernet communications to help us make the leap from centralized to distributed, automated systems.

"Digital's architecture in systems, software, and networking was key to our choice. It's easy to use, highly flexible, distributed and expandable. And it delivers the goods...far better than what we'd been used to.

"The VAX and Ethernet solution has been a godsend. Teamwork and information sharing are vastly improved. We're able to respond much more quickly to our customers' needs.

"We can now change the way we do things, not just do the same things better. Competitively speaking, we're very well positioned for the future."

The rewards of working together.


Digital's single architecture ensures that all Digital computers work together, with total software interchangeability.

Today, with the best architecture, Digital gives you an elegantly simple way for your people to work together more productively, more creatively, more efficiently, more competitively.

To learn more, write to Digital Equipment Corporation, 200 Baker Avenue, Concord, MA 01742-2190. Or call your local Digital sales office.

A way to work together like never before.

Digital
has
it
now.



Andrew Harriss
Manager, Information Systems
DuPont Fibers

Tired Of Just Treating The Symptoms Of Multi-Vendor Network Management Pains?

Tired of the bandage approach to Network Management?

Finding it hard to stomach the usual File Transfer problems?

Looking for relief from Help Desk headaches?

Losing sleep over Computer Operations nightmares?

Feeling uneasy about Network Access and Security?

Our NET/MASTER™ Seminars Will Help You Find The Cure.

It's our free "Solutions In Multi-Vendor Network Management" Seminar Series. In one morning, it can show you how NET/MASTER can ease the symptoms and ultimately get rid of your network problems.

You'll hear an on-target analysis of today's multi-vendor network environments. Also, learn how to simplify management of your own network—from James G. Herman, a leading consultant in the design, management and operation of mixed-vendor and mixed-system networks.

THE NET/MASTER™ SEMINAR SERIES

City	Seminar
Boston	February 14, 1989
Toronto	February 15, 1989
New York/ New Jersey	February 16, 1989
Philadelphia	February 17, 1989
Washington, D.C.	February 21, 1989
Cincinnati	February 22, 1989
St. Louis	February 23, 1989
Chicago	February 24, 1989
Dallas	February 28, 1989
Los Angeles	March 1, 1989
San Francisco	March 2, 1989

And, you'll see a demonstration of NET/MASTER, the system that's "three

to four years ahead of NetView," as stated by Gartner Group's Michael Braude.

Don't suffer from multi-vendor network pains any longer. There's a better solution. Call us today for more information, or to register. But hurry—space is limited!

1-800-543-3010

In Ohio, 513-661-6000 • In Canada, 1-800-387-5914

CINCOM
The Better The Solution, The Better The Value.™

Barnes

FROM PAGE 25

as a technical problem rather than the social one they are. If you think you're facing malevolent geniuses, you're going to divert a lot of intellectual resources to securing yourself against them. Further, because genius is scarce and valuable, you'll aim for leniency toward the ones who get caught, hoping to turn their "talents" to good purpose.

Steps to take

The truth is that there are adequate technical remedies already in existence for viruses. "Safe computing" is already here, and it's cheap. It has to do with physical security — not downloading anything from the outside into a system without knowing where it's from. When there's doubt, it must be subjected to a program that can find viruses.

What hasn't been here is the willingness to jail the offender. The punishment must be in proportion to the crime. Damage in the millions of dollars ought to warrant time behind bars.

There are a lot of people in the world who are fairly smart but not smart enough to support their own egos. They have grandiose visions, but while they talk well, they deliver little. After a while, these dreamers haven't gotten nearly as far as they think they should have. So they begin to feel it's a nasty, ugly world, one that knocks things apart for no reason, and naturally enough, they develop an ugly desire for random destruction.

If they've been told that their unpleasant activities are works of genius, that lets them reclaim some of their lost ego inflation: "Poor, misunderstood genius me, I'll show them how clever I am." What we need to get across to the public is that viruses are the products of second-rate minds with first-magnitude grudges.

If you find yourself interviewed on the subject, especially after an incident at your facility, let me suggest an example that I've found useful in explaining things to computer-illiterate and computer-phobic friends: Suppose you have a robot in your kitchen that does all the cooking. The robot reads instructions you write on file cards, one instruction to a card, such as "Pre-heat oven to 375 degrees" or "Add garlic and onion and simmer for another half hour." A benign virus is the equivalent of a card that says, "Make a copy of this card and put it in the deck of another recipe."

If it's less benign, it might be three cards, saying, "Make a copy of this and the next two cards, changing any name of a day to the next day, and put

them in the deck of another recipe. If this is Tuesday, empty the catbox into the food. If you have emptied the catbox into the food, pull out this and the previous two cards and burn them." If you want to devise other examples of recipe viruses, you'll find it's easy — because you hardly have to know a thing about programming.

The person who wrote the

virus does not need to know how to cook. He doesn't need to know anything much about the kitchen or even about the robot. He is, in short, not much more than an annoying vandal.

By controlling who gets into your kitchen, you can control him. Who are the really clever people? The ones who can write programs that catch viruses. I've seen several such programs

in action and looked at their operation in detail, and I'm impressed.

Imagine — to return to the example — a set of file cards that would tell the robot how to search a recipe for viruses, find them and discard them. You'll quickly see how much more intellectually demanding it is.

If we can get the idea out to the public that a virus maker is

not a genius, not a twisted lonely soul and much more a nuisance than a menace, we'll have robbed him of his chance to see himself as a hero and his power to frighten upper management into expensive, unnecessary crash programs.

Barnes is the Pacific Northwest area manager at ADG, a high-tech marketing organization based in San Pedro, Calif.

Systems software for MVS data centers:

Enter the world of total security, total support.

Computer Associates announces the industry's only complete security software solution:

**CA-UNIPACK™/SCA
SECURITY, CONTROL AND AUDITING**
Consisting of CA-ACF2™ or CA-TOP SECRET™, CA-VMAN™ and CA-EXAMINE™.

Utilizing advanced security techniques and integrated, industry-leading software, CA-UNIPACK/SCA provides total access control, enhanced network security and complete MVS operating system auditing capabilities including virus detection.

With the industry's largest and most knowl-

edgeable security staff, Computer Associates alone has the resources and expertise to provide this cost-effective solution. And no one else can match CA's commitment to the present and future of the security industry.

And only Computer Associates offers **CA-UNISERVICE™ III**, a secure link between your mainframe and CA's Customer Service System 24 hours a day. You get online access to software fixes, interactive problem resolution, plus product tutorials and more!

Call Dana Williams today
800-645-3003 (Ext. 0006)



© 1988 Computer Associates International, Inc.
711 Stewart Ave., Garden City, NY 11530-4787

**COMPUTER
ASSOCIATES**
Software superior by design

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

- World's leading independent software company
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers
- Worldwide service and support network of more than 100 offices

**19 Years Ago,
When Most People Were Focused On This,**



**General DataComm People Were
Already Focused On This.**



**That's Why No Other Vendor Can Introduce Such An Advanced
Integrated Network Management System.**

About the time Neil Armstrong was first walking on the moon, General DataComm took the first important step toward network management. It was the recognition of a need for network control, diagnostic and administrative tools. The idea became a concept. Then a strategy. And today, it's real hardware and software. Introducing the MEGAVIEW® Integrated Network Management (INM) System from General DataComm. The first unified, intelligent system for managing global networks.

**Now You Have Effective
Control Over Both Public And
Private Networks.**

Our MEGAVIEW INM system provides complete end-to-end management of both public and private networks. From one terminal. From any location. It gives

you quality control - independent of both the carrier and the host computer. For instance, MEGAVIEW supports a full array of line impairment measurements and calculates network delay within each communications element. This gives you the details of circuit performance required for maximum control.

Now, for the first time, you can evaluate the quality of a transmission path before making a routing decision. What's more, you establish the quality levels appropriate to each specific application. The result is both improved quality of service and more efficient use of bandwidth.

**We Have A Clear View Of
The Future.**

Even our MEGAVIEW INM system won't work in a vacuum. That's why we offer a complete line of net-

work products. From analog, digital and local area data sets to advanced networking multiplexers and packet switching products. All compatible. All with intelligence of their own. And all operating simultaneously under the control of MEGAVIEW. Which means as you build and expand your network, it will all work together. Whether your network is national or multinational.

The next step is yours. Why not let us show you how our Integrated Network Management system can take your network into the 21st century. Just call, or write. And we'll give you the complete picture.

**1-800-777-4005, General DataComm,
Middlebury, CT 06762-1299. Tel.: (203) 574-1118,
Telex: 643357, Fax: (203) 758-8507.**

In Network Strategies, There's Only One General.



General DataComm

SEE US AT COMNET '89 BOOTH #934

Medical

FROM PAGE 29

man dimensions derived from CAT scans or nuclear magnetic resonance (NMR) techniques, university researchers say.

CAT and NMR scans tend to highlight bony structures and cartilage but do little to show soft-tissue structures.

The examination

Rather than scanning a body electronically, UIC researchers obtain a physical slice of a cadaver measuring one millimeter thick. This is accomplished by first displacing the water in the body with plastic, which gives the tissue sufficient rigidity to be sliced. The slice is then X-rayed, and the resulting image is stored digitally.

Once entered into the Cyber 930 system, the Standard Man data can be accessed by a Cyber 910 graphics workstation, several AT&T microcomputers and an AT&T 3B 40000 minicomputer. All of these computers

run AT&T's Unix System V and can exchange their multimegabyte files on a common network spanning two adjoining labs. A single 3-D image of a human body requires 2.2G bytes of memory.

Because many computers are obtained through vendor grants, UIC's computing philosophy is one of flexibility.

"We want to maintain a multi-

vendor environment," said Thomas Prudhomme, a fund-raising official at UIC who assists the university's chancellor in fund-raising ventures. "We want to provide any faculty member with the computer platform of his choice."

Sometimes platform choices are limited by which vendors choose to donate — or discount — their computer systems for

use at the university.

In the case of Project Da Vinci, AT&T's donation of more than \$1 million in hardware and software products dictated the use of Unix System V. But funds from other grants were used to procure additional computers, Prudhomme said.



Missing children are 'aged'

Systems software for MVS data centers:

Enter the world of total administration, total support.

Introducing CA-UNIPACK™/DCA—an advanced software system from Computer Associates that automates the complex tasks of MVS data center management.

CA-UNIPACK/DCA-DATA CENTER ADMINISTRATION

Consisting of CA-NETMAN™/FINANCIAL, CA-NETMAN™/PROBLEM and CA-NETMAN™/OLCF.

CA-UNIPACK/DCA automates and integrates hardware and software inventory management, help desk and problem tracking, configuration changes, invoice reconciliations, cost allocations, budgets, vendor contracts, user chargebacks, order tracking and more. It has the unique ability to interrelate these diverse activities so that a

change in one area is immediately and automatically reflected in another.

CA-UNIPACK/DCA provides online, real-time control over critical managerial functions while it reduces costs, increases staff productivity and ensures sound decision making. Total administrative control. Only from Computer Associates.

And only Computer Associates offers CA-UNISERVICE™ III, a secure link between your mainframe and CA's Customer Service System 24 hours a day. You get online access to software fixes, interactive problem resolution, plus product tutorials and more!

Call Dana Williams today
800-645-3003 (Ext 0006)

Soft notes

FROM PAGE 29

ment organizations and other fund-raising requirements. Advance/SAA will be functionally comparable to Business Systems Resources' current Digital Equipment Corp. VAX and IBM/Cullinet Software, Inc. versions of Advance.

Sybase, Inc. recently opened a Canadian subsidiary that is expected to be headquartered in Toronto. Sybase develops relational database management systems designed for on-line applications.

Vista Financial Systems, Inc. won a contract with American Savings Co. in Omaha to provide on-line data processing services. Under the contract, the bank will install the Vista Financial Terminal System, which is a personal computer-based teller and host system.

IXI Ltd in Cambridge, England, a developer of X Windows standard-related software and services, said it will tailor its desktop manager program, called X.desktop, to support the Open Software Foundation as well as AT&T Open Look style guides.

Compusystems, Inc., a developer of banking software specializing in mainframe collection and recovery, said Household Finance Corp. selected Compusystems' The Tracker on-line collection system.

Household Finance will use the software package to handle the collection needs of its 800 consumer finance offices located throughout the U.S.

© 1988 Computer Associates International, Inc.
711 Stewart Ave., Garden City, NY 11530-4167

COMPUTER ASSOCIATES
Software superior by design

- World's leading independent software company
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers
- Worldwide service and support network of more than 100 offices

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

Cut database development costs.

Special offer. SQL development system only \$395.

Seldom has so much been available for so little.

Introducing the SQL Developer Series from Informix. Which consists of, take a deep breath, the MS-DOS version of INFORMIX-4GL RDS/ID (our powerful INFORMIX-4GL Rapid Development System and Interactive Debugger) plus INFORMIX-SQL (our best-selling relational database management system).

And for a limited time, you can get all that software (a \$2290 value) for only \$395*. We'll even provide an optional 6-month maintenance contract for \$250.

Develop in DOS. Port to large systems.

Better yet, the software is as special as the offer. You see,



the SQL Developer Series lets you quickly and easily develop, debug and compile your SQL application in DOS (without 640K memory restrictions)** And because the application you develop is in p-code, it's directly portable to UNIX, XENIX or networked DOS, without rewriting or recompiling***

Clip this ad to cut your costs.

Simply put, the SQL Developer Series is the most productive, least expensive way to build SQL applications. So order yours today. Fill out the coupon portion of this ad and send it to the address below. Or call (415) 322-4100.

INFORMIX
#1 for good reason.

____ Please send the SQL Developer Series for \$395 (shipping included). ____ 3½" diskettes ____ 5¼" diskettes
____ I'd also like the 6-month maintenance contract for \$250.

Name _____ Title _____ User or VAR? _____

Company _____ Address _____

City _____ State _____ Zip _____ Phone _____

Requirements: IBM® PC, PC/XT®, PC-AT®, PS/2 Series or 100% compatible, DOS 3.1, 3.2, 3.3, 640K RAM. Note: extended memory supported, but not required.

Method of payment. Circle one. Check M/C VISA AMEX

Card No. _____ Exp. Date _____ Signature _____

Mail to Informix Software, Inc., Dept. DP88, 4100 Bohannon Drive, Menlo Park, CA 94025. Prices in U.S. currency.

*Offer expires February 28, 1989. Ask us about run-time licenses for UNIX, XENIX and networked DOS systems. **Up to 16MB memory supported if available.

***Obviously, mixed 4GL/C programs or code written to take advantage of specific operating system features may need to be rewritten or recompiled.

Informix is a registered trademark of Informix Software, Inc. All other names indicated by ® or ™ are trademarks or tradenames of their respective manufacturers.
© 1988, Informix Software, Inc.

Get The Competitive Edge On The Week Ahead!

YES, I want to be the first to know! Please send me 51 weekly issues of **COMPUTERWORLD** for only \$39.00*— just 76¢ per copy. In addition, I'll receive **FREE** bonus issues of **COMPUTERWORLD FOCUS!**

Address shown: ☐ Home ☐ Business

First Name _____ MI _____ Last Name _____
 Title _____ Company _____
 Address _____
 City _____ State _____ Zip _____

1. BUSINESS/INDUSTRY (Circle one)

- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medicine/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government — State/Federal/Local
- 70. Communications Systems/Public Utilities/Transportation
- 80. Mining/Construction/Healthcare/Refining/Agriculture
- 90. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 95. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
- 96. Computer Peripheral Dealer/Distributor/Retailer
- 97. User: Other _____
- 98. Vendor: Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)

- 18. MIS/DP MANAGEMENT
- 19. Vice President, Asst. VP
- 21. Dir. Mgr. Suprv. SMMS/DP Services
- 22. Dir. Mgr. Suprv. of Operations, Planning, Admin. Services
- 23. Dir. Mgr. Suprv. Analyst. of Systems
- 31. Dir. Mgr. Suprv. of Programming
- 32. Programmer, Methods Analyst
- 33. Dir. Mgr. Suprv. OANVP
- 38. Data Comm. Network/Systems Mgt.
- OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
- 12. Vice President/Asst. VP
- 13. Treasurer, Controller, Financial Officer
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 51. Sales/Mktg. Mgt.

OTHER PROFESSIONALS

- 69. Consulting Mgt.
- 70. Medical, Legal, Accounting Mgt.
- 80. Education, Journalism, Librarian, Students
- 90. Others _____ (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant

- A. Mainframes/Supernovels
- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems
- F. No Computer Involvement

COMPUTERWORLD

* U.S. only

E2904-4



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

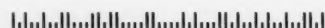
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD



P.O. Box 2044
Marion, Ohio 43306-2144



Heroes

FROM PAGE 25

will allow applications to be changed much faster as requirements change, he said.

In keeping with the philosophy of using AI to simplify everyday tasks, MCI has used expert systems to automate jobs it understands very well, thereby freeing up an expert's time.

One such application involves managing microwave transmissions, a major task at MCI. Microwave signals frequently have to be rerouted and switched to a spare transmission path. To manage this, data on microwave signals is monitored and fed to a surveillance center. The work of poring through this incoming

data and deciding which signals need to be switched to another path was a full-time job.

Today, an expert application developed with Intelicorp, Inc.'s Knowledge Engineering System, called the Switch to Spare system, classifies the data and identifies signals that must be rerouted.

At American Mutual Family Insurance Group in Madison,

Wis., the primary focus of expert systems are, like MCI's, not esoteric but everyday applications, according to Herb Thompson, development support supervisor.

One expert systems application, the Equity Data Calculator, calculates the return amount due a customer after insurance has been canceled because of a bounced check. Before this sys-

tem came on-line a month ago, employees had to get information from three different databases and use a calculator to figure out the prorated value of a premium and, ultimately, the amount of the return.

In addition to ensuring that money is not returned inappropriately, Thompson estimates that at least 10 minutes of processing time is saved for every

situation in which insurance is canceled because of a bounced check — about 150 times a day.

Users can access the application, which runs in an IBM MVS/XA environment, from standard menu options displayed on their terminals. Using expert systems techniques has drastically cut development time and simplified maintenance, Thompson said.

DEC

FROM PAGE 25

these changes exceed user-established thresholds, DEC officials said. EMS sensors can be located up to 5,000 feet away from the command-post microprocessor, DEC said.

Users can also customize their levels of response. A first alert to a computer room exceeding its temperature, for example, may be for a warning bell to ring at a central command post. If the temperature rises a few degrees, the whole system could automatically shut down.

The EMS can work as a stand-alone unit, be daisy-chained to seven additional computer installations at a site to form a monitoring network or be hooked via a modem to a system manager's home, DEC's Williams said.

Environment watch

An optional software package — VAX Remote Environmental Monitoring Software (REMS) — gives an operator the ability to monitor data garnered from an entire network of environmental-monitoring systems.

REMS provides a continually updated database on such things as power conditions, temperature, water and the status of security systems, DEC officials said. When REMS detects an abnormality, it automatically relays alarm signals, sends electronic mail and activates preprogrammed defenses.

If one power supply fails, for example, the software can automatically switch computers to another source while simultaneously notifying systems personnel, said EMS product manager John Yurcak.

A basic EMS starter package including four on/off-type switch sensors that can be connected to a fire alarm or sprinkler system, one water detector, two temperature sensors and an output relay sells for \$5,995, DEC said. A REMS package costs \$3,650.

Systems software for MVS data centers:

Enter the world of total production control, total support.

Computer Associates introduces CA-UNIPACK™/APC, the only production control software system to offer real solutions that meet the growing demand for unattended operations.

CA-UNIPACK/APC-AUTOMATED PRODUCTION CONTROL

Consisting of: CA-SCHEDULER™ or CA-7™, CA-11™, CA-OPERATOR™, CA-PRODUCT™, CA-JCLCHECK™, CA-DISPATCH™ and CA-RAPS™.

Unattended operations is now a reality because CA-UNIPACK/APC provides automation for the entire production operation. Automating: workload planning and scheduling, production JCL set up and validation, realtime monitoring and problem identification, restart and recovery, console activity management and

report distribution.

As an advanced, integrated production control system, CA-UNIPACK/APC creates a synergy that results in startling productivity gains including improved workload throughput, system availability and end-user service levels.

Only Computer Associates has the products and expertise to provide MVS data centers with such a cost-effective, total solution.

And only Computer Associates offers CA-UNISERVICE™, a secure link between your mainframe and CA's Customer Service System, 24 hours a day. You get online access to software fixes, interactive problem resolution, plus product tutorials and more!

Call Dana Williams today: 800-645-3003 (Ext. 0006)



© 1988 Computer Associates International, Inc.
711 Stewart Ave., Garden City, NY 11530-4787

COMPUTER ASSOCIATES
Software superior by design.

- World's leading independent software company.
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers.
- Worldwide service and support network of more than 100 offices.

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

3 things a
modem network
management
system has never
been till now:

Simple. Affordable. Fujitsu.

Introducing FMS 1000™—Fujitsu's answer to costly, complicated network management systems.

Like other systems, FMS 1000 lets you manage your communications network pro-actively instead of reactively. To reduce downtime. Increase productivity. And keep users happy.

But unlike other systems, FMS 1000 is simple to use and a snap to install. It's built on industry-standard hardware and Microsoft's® popular, powerful Windows software. And best of all it sets a new standard in price-performance, making it the only truly affordable network management system of its

kind for growing companies.

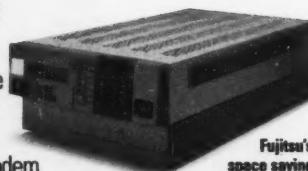
There's a reason we can offer so much for so little: Fujitsu's single-board modem technology. Proprietary LSI technology that makes our LN line the world's smallest, most inte-

grated networked modems.

Modems so reliable, they come with an outrageous guarantee: should one fail during the first year, we'll give you another modem free. And fix the first one, also for free.

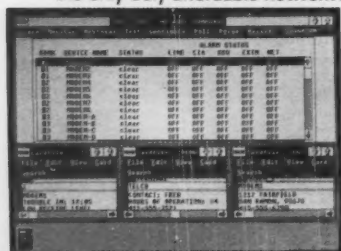
That's Fujitsu Modem Insurance*—backed by one of the best nationwide service networks in the business.

Now that you know a thing or three about this new system, there's just one thing more to do: pick up the phone and call 800-422-4878, in California, 408-434-0460, and in Canada, 416-673-8666, for more information on how simple and affordable a network management system can be.



Fujitsu's space saving LN modems: sophisticated yet easy to use.

The FMS 1000 controller features an industry standard format and high-res color display.



Microsoft's mousedriven Windows software makes FMS 1000 network management functions easy to learn and use.

FUJITSU

**FUJITSU AMERICA
DATA COMMUNICATIONS**



*The limited offer for Fujitsu Modem Insurance is only open to new purchases of LN, L and EZ modems from an authorized Fujitsu America distributor and is subject to the terms of our Modem Insurance Policy.

FMS 1000™ is a trademark of Fujitsu America, Inc.
Microsoft® is a registered trademark of Microsoft Corporation.

NEW PRODUCTS — SYSTEMS

Turnkey systems

Radstone Technology has announced the **68-33**, a Motorola, Inc. 68030-based board for VMEbus multiprocessing applications.

The product reportedly provides up to 2M bytes of quadported, no-wait state random-access memory and operates at speeds up to 33 MHz. According to the vendor, the board is compatible with a variety of operating systems and software including VXCEL, a proprietary operating environment based on VRTX32, and Unix.

The 68-33 is priced from \$4,595.

Radstone, 1 Blue Hill Plaza, Pearl River, N.Y. 10965. 800-368-2738.

Sky Computers, Inc. has introduced a Motorola, Inc. VMEbus version of its Warrior II array processor for Sun Microsystems, Inc. workstations.

The **Sky Warrior II/S** can reportedly execute complex algorithms up to 27% faster than the company's previous Warrior product for Sun-3 and Sun-4 platforms. Designed specifically for engineering and scientific applications, the board also includes a software library of vector subroutines that can be executed from Fortran or C language programs.

The **Sky Warrior II/S** costs \$11,900.

Sky Computers, Foot of John St., Lowell, Mass. 01852. 617-454-6200.

Intel Corp. has introduced a set of boards developed to combine the capabilities of its 80386-based processor, Multibus II multiprocessing architecture and DOS-compatible software.

The **Multibus II PC Subsystem** reportedly consists of a 16-MHz 80386 CPU board, a peripheral companion board containing a hard-disk controller and IBM Video Graphics Array controller and an adapter board that allows users to add standard half-length IBM Personal Computer XT and full-length PC AT bus boards.

Scheduled for availability in the second quarter, the products are priced from \$195 to \$4,700.

Intel, P.O. Box 58065, Santa Clara, Calif. 95052. 800-548-4725.

Simpact Associates, Inc. has released its **Real-Time Clock (RTC)** for Digital Equipment Corp. VAXBI-class computers.

The RTC is a programmable real-time clock option that is said to provide high-resolution, precise interval timing.

Features include a 32-bit-wide counter, and up to 512

events can be timed, counted and stored for subsequent retrieval by the host application program, the vendor said.

The RTC is priced from \$4,990 to \$5,890.

Simpact, 9210 Sky Park Court, San Diego, Calif. 92123. 619-565-1865.

Data storage

An 8-in. 727M-byte Winchester disk drive subsystem has been announced by **Data General Corp.**

The **Model 6492-A** was designed for medium and large multiuser environments and is supported on the DG Eclipse/MV family of computers, the company said.

The **Model 6492-A** costs \$16,400 and includes a one-year, on-site warranty.

DG, 3400 Computer Drive, Westboro, Mass. 01580. 508-898-4051.

An optical host adapter specifically designed for Digital Equipment Corp.'s Unibus systems has been announced by **Qualogy, Inc.**

The quad-wide **QLC-1100** is reportedly compatible with DEC hardware and software. It allows the optical storage system to replace any tape-storage system without modifying the applications software, the vendor said.

The **QLC-1100** costs \$2,395.

Qualogy, 1751 McCarthy Blvd., Milpitas, Calif. 95035. 408-434-5200.



Systems software for MVS data centers:

Enter the world of total resource management, total support.

Computer Associates announces the industry's most extensive, integrated software for systems managed storage environments:

CA-UNIPACK™/SRM
STORAGE AND RESOURCE MANAGEMENT
Consisting of: CA-1™ or CA-DYNAM™/TUMS, CA-ASM2™, CA-BLOCKMASTER™, CA-SORT™, CA-SRAM™ and CA-UCANDU™.

CA-UNIPACK/SRM completely automates storage and resource management functions in even the most complex data center environments. It provides comprehensive tape and DASD management facilities, sort/merge and file manipulation utilities and comprehensive management reporting.

CA-UNIPACK/SRM optimizes storage utilization, often eliminating the need for costly additional hardware. It ensures data integrity by enforcing

installation-defined storage standards and protecting data resources. It increases data center productivity by eliminating labor-intensive, error-prone tasks, freeing up valuable staff, as well as by reducing job elapsed times through faster and more efficient sorting.

Only Computer Associates has the products and expertise to provide this cost-effective, total solution.

And only Computer Associates offers **CA-UNISERVICE™/II**, a secure link between your mainframe and CA's Customer Service System 24 hours a day. You get online access to software fixes, interactive problem resolution, plus product tutorials and more.

Call Dana Williams today:
800-645-3003 (Ext. 8006).

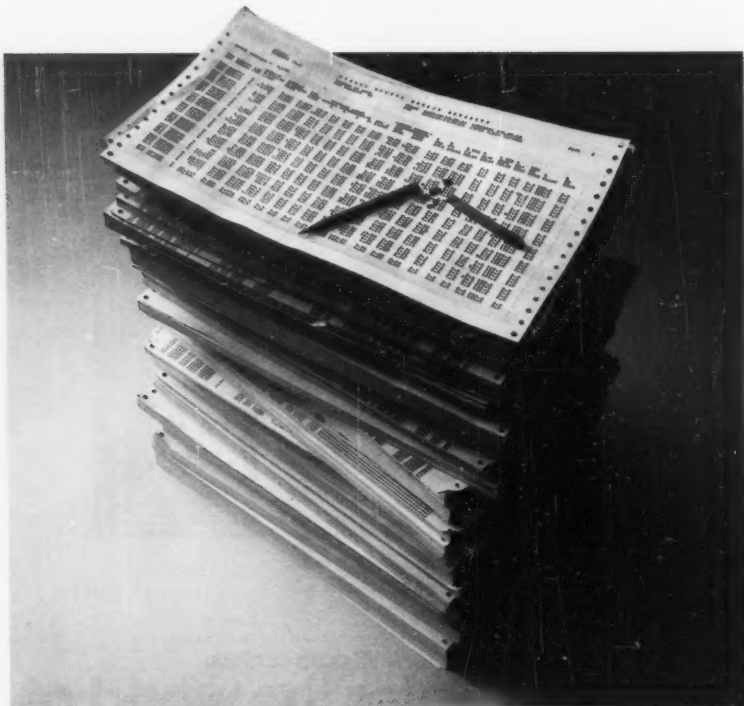
© 1988 Computer Associates International, Inc.
711 Street Ave., Garden City, NY 11530-4787

COMPUTER ASSOCIATES
Software superior by design.

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

- World's leading independent software company
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers
- Worldwide service and support network of more than 100 offices

MOST DASD PERFORMANCE SOFTWARE TELLS YOU WHAT'S GOING WRONG.



WE TELL YOU HOW TO MAKE IT RIGHT.

Until now, DASD tuning was a painstaking task-requiring hours of statistical analysis just to figure out what was wrong. Correcting problems often involved guesswork, trial and error and just plain luck. DASD ADVISOR from Boole & Babbage tells you exactly what's going wrong and how to make it right.

DASD ADVISOR is an EXPERT system-based DASD tuning tool that eliminates the need to wade through piles of performance

statistics. It analyzes the performance of your entire DASD subsystem, from individual data sets, through hundreds of devices, controllers and channels. It identifies data bottlenecks, then makes specific tuning recommendations. All in concise English. So you have what you need to improve DASD performance. And time to solve other system performance problems.

For a free demo diskette that shows you how DASD ADVISOR can help you make it right, call Chris Walker. In California: 800-624-5566. Outside California: 800-822-6653.

Boole & Babbage, Inc., 510 Oakmead Parkway, Sunnyvale, California 94086.

**Boole &
Babbage** 

The Performance People

NEW PRODUCTS — SOFTWARE

System software

Burr-Brown Corp. has introduced a transaction processing software package designed to add real-time, networked data collection capabilities to Digital Equipment Corp.'s VAX/VMS-based computer systems.

The **TMV9000** tool manages a network of Burr-Brown data collection devices, the vendor said, and provides a straightforward interface between data collection systems and other manufacturing applications software. A 1,600 bit/in. 9-track tape or TK50 cartridge is included.

Pricing is dependent on individual system configuration.

Burr-Brown, P.O. Box 11400, International Airport Industrial Park, Tucson, Ariz. 85734. 602-746-1111.

An end-user support information system for IBM IMS/DC and CICS environments has been announced by **4.ST North America, Inc.**

TIMS 1.3.1. is an on-demand Help, support and documentation facility that can be accessed from any IMS or CICS transaction, according to the vendor. It was developed to replace manuals and other printed documents with on-line, real-time updates and to reduce end-user training time by making applications easier to use.

The software is priced from \$6,000 to \$125,000, depending on configuration.

4.ST North America, Suite 412, Oakwood Corporate Center, 401 Whitney Ave., Gretna, La. 70053. 504-366-9944.

Applications packages

Vista Financial Systems has introduced an on-line, real-time integrated retail banking system.

The **Advanced Financial System (AFS)** software is available for fault-tolerant systems and is said to organize all account, financial and demographic information by customer name rather than by account type. AFS can operate with on-line services or in-house, turnkey systems.

Single-license fees range from \$400,000 to \$700,000, depending on the customer's computing configuration and options purchased.

Vista Financial, Suite 400, 1807 Park 270 Drive, St. Louis, Mo. 63146. 314-878-4210.

Computerline, Inc.'s Plantrac Project Management System is now available for Apollo Computer, Inc. workstations running the AT&T Unix System V operating system.

Developed for project managers and planning engineers, the software reportedly offers day-to-day or hour-to-hour scheduling and management of both large and small products. Features include computer-aided design techniques and report-writing capabilities.

According to the vendor, the **Plantrac Project Management System** for Apollo and Sun Microsystems, Inc. workstations is priced from \$5,995 for a three-user license.

Computerline, P.O. Box 308, 52 School St., Pembroke, Mass. 02359. 617-294-1111.

Languages

The **Dylakor Co.** division of **Sterling Software, Inc.** has announced enhanced versions of **Dyl-280** and **Dyl-280 II**, the company's fourth-generation language information management software package.

Designed to run on IBM and compatible mainframes, the product reportedly includes additional keywords in the print function and extended arithmetic capabilities.

capabilities.

Dyl-280 Release 5.5 is priced at \$13,000 for VSE or VM environments, \$16,000 for MVS environments. **Dyl-280 II Release 2.5** is priced at \$17,000 for VSE and VM environments. An MVS version costs \$20,000.

Dylakor, P.O. Box 2210, Chatsworth, Calif. 91313. 818-718-8877.



Systems software for MVS data centers:

Enter the world of total performance measurement, total support.

Computer Associates introduces the industry's first integrated solution incorporating performance measurement, capacity planning, resource management, network monitoring and job accounting:

CA-UNIPACK™/PMA
PERFORMANCE MEASUREMENT AND ACCOUNTING
Consisting of CA-FASTDASD™, CA-SS/THREE™, CA-MAZDAMON™, CA-JARS®, CA-JARS®/CICS, CA-JARS®/DSA and CA-JARS®/IDMS or CA-JARS®/IMS.

With **CA-UNIPACK/PMA**, you can fine tune your system, improving its performance and optimizing the utilization of resources. You can reduce costs by accurately forecasting future hardware needs thereby avoiding unnecessary and costly additions or upgrades. You can accurately charge back costs to end

users, allowing you to treat the data center as a profit center. And most importantly, you can easily achieve the CICS response times end users expect, enabling you to consistently maintain service level agreements.

Only Computer Associates has the proven products and expertise to offer this cost-effective, total performance solution.

And only Computer Associates offers **CA-UNISERVICE®/IL**, a secure link between your mainframe and CA's Customer Service System 24 hours a day. You get online access to software fixes, interactive problem resolution, plus product tutorials and more!

Call Dana Williams today:
800-648-3003 (Ext. 0006).

© 1988 Computer Associates International, Inc.
711 Stewart Avenue, Garden City, NY 11530-4767

COMPUTER ASSOCIATES
Software superior by design

Resource & Operations Management • Financial • Banking • Graphics • Spreadsheets • Project Management

- World's leading independent software company
- Broad range of integrated business and data processing software for mainframe, mid-range and micro computers
- Worldwide service and support network of more than 100 offices



**Create a 3.5"
Micro Diskette
with unlimited
protection against
a hostile world.**

You're covered. BASF molds the rigid plastic jacket of its 3.5" Micro Diskette to its own specifications, providing unsurpassed protection for the flexible disk within. Call 800-343-4600 for the name of your nearest supplier.

The Spirit of Innovation.



BASF

MICROCOMPUTING

MICRO BITS

Douglas Barney

Slapping the DEC



Failing over and over again. As many have heard, DEC is at it again in the so-called desktop wars. Although DEC has failed in this market with many machines, it is useful to separate its efforts into three distinct, though feeble, waves.

The first wave broke in the early 1980s and consisted of three very different architectures: The Decmate dedicated word processor; the Decpro, a sophisticated computer for technical-type users that shared little with its contemporaries; and finally, the Rainbow, a decent yet ill-conceived machine that people still love to laugh at.

The Rainbow was the most visible failure because it was most like an actual personal computer. It ran MS-DOS and used an Intel chip. The problem was that it had its own incompatible RX-50 floppy drives, used a serial instead of a parallel port for printing and needed to have software rewritten in order to run it. Although one can excuse DEC because the machine was essentially designed before the IBM Personal Computer hit the market, the *Continued on page 50*

Macworld Expo is revisited

One year later, the Apple/DEC liaison has yet to produce anything

BY JULIE PITTA
CW STAFF

SAN FRANCISCO — Last week's Macworld Expo marked the one-year anniversary of Apple Computer, Inc.'s much-publicized liaison with Digital Equipment Corp.

That marriage, announced at a hastily assembled press conference that kicked off last year's Macworld Expo, has yet to bear fruit, despite acknowledgment that there was synergy between Apple's Macintosh personal computer and DEC's VAX mini-computer.

"There hasn't been a whole lot concrete that's come out of

the relationship," said Nina Burns, vice-president of Infonetics, Inc., a Santa Clara, Calif.-based market research firm.

Speculation after the announcement focused on the possibility of the two companies jointly developing products or even the possibility of DEC peddling Macintoshes as terminals to its VAX minicomputers. Neither has happened, and it now seems unlikely that DEC will be hawking Macs following its recent introduction of its own line of desktop systems.

Third-party developers are heartened by the news that neither Apple nor DEC has introduced competing products. "It

was an arrangement of convenience," said Steve Nelson, marketing director at Kinetics, Inc., a third-party developer of Mac-to-VAX connectivity products. "There was so much hoopla a year ago that made it almost seem like they were merging."

"Not a lot has changed," Nel-

son said. "People were buying Mac-to-VAX connectivity products, and they're continuing to do that."

Third parties are awaiting developer's guidelines for future-generation products.

The Apple-DEC partnership overshadowed a myriad of products introduced by Apple third parties as well as three printers introduced by Apple itself. Apple and DEC's relationship is not the only disappointment from last

Continued on page 49

End users navigate hard disks with Magellan

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — Some companies sell shell programs that shield users from the difficulties of Microsoft Corp.'s MS-DOS. Others sell tools that search hard disks for particular pieces of information. And others pitch packages that help users back up data in case of power failure.

Beginning in April, Lotus Development Corp. will offer Magellan, a unique \$199 package that provides file searching capability with a few twists. For instance, once a file is located, the user can read the file using its native file format. This will allow users to view, for example, 1-2-3 worksheets, even though they do not have a copy of 1-2-3.

In addition, Magellan can automatically launch the user into the application that created it to perform further editing,

printing or transmission.

Magellan also implements "fuzzy" searching, allowing users to key in items that approximate what is actually on the disk.

"There is very little here that is actually new," said Lotus Vice-President Ed Belove. Instead, it is the combination of technologies that make Magellan unique, Belove said.

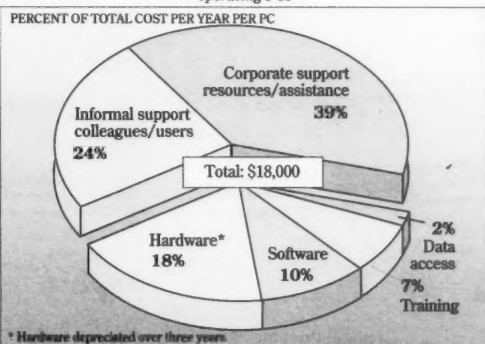
Magellan is also handy for gathering information from a variety of files and putting it together for a report. For example, a user can search a disk for all files that pertain to IBM Personal Computer pricing and pull

Continued on page 50

Data View

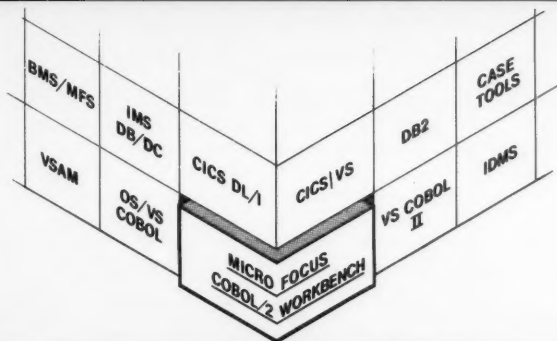
How much does your PC really cost?

Support makes up nearly two-thirds of the lofty yearly cost of owning and operating PCs



SOURCE: NOLAN, NORTON & CO.
CW CHART: JOHN YORK

Mainframe technology, but PC productivity. Now!



Micro Focus COBOL/2 Workbench™
The cornerstone of mainframe development productivity

Use Micro Focus COBOL/2 Workbench as the cornerstone of your application development strategy. The PC development environment based on COBOL/2 Workbench outperforms the host and provides programming, testing and debugging tools unavailable elsewhere. For the most efficient development of your mainframe applications using *any* of these technologies, call us now.

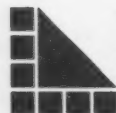
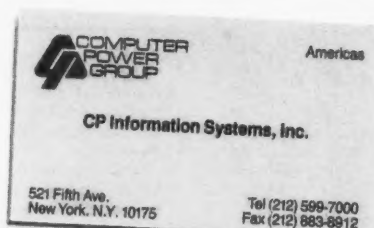
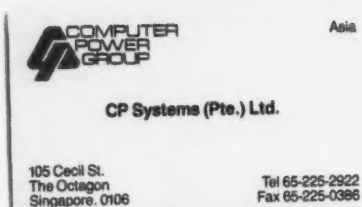
1-800-872-6265

Micro Focus, Inc.
2465 East Bayshore Road, Suite 400
Palo Alto, California 94303
United States
Tel: (415) 856-4161

Micro Focus Europe, Ltd.
26 West Street
Newbury, Berkshire RG13 1JT
United Kingdom
Tel: (0635) 32646

MICRO FOCUS®
A Better Way of Programming™

THERE'S A WORLD OF DIFFERENCE BETWEEN US AND OTHER COMPUTER SERVICES AND SOFTWARE COMPANIES.



We're Computer Power Group. And we're different than any other computer services and software company. First of all, we're a global, entrepreneurial organization with a network of 2,500 full-time professionals in 80 cities on four continents. Many know us by the names of the divisions shown above.

Secondly, we're the *only* computer services and software company specializing in *all* seven of the disciplines that comprise software services: professional services, systems integration, professional and technical resources, education and training, software maintenance services, network and operations management, and applications software packages and productivity tools.

In addition, these seven services all share access to a state-of-the-art delivery system we call TDSS: Technologies for the Delivery of Software and Services. TDSS consists of both proprietary and off-the-shelf software tools and service methodologies that can be applied to all the projects we undertake.

Our professionals help you evaluate and select the right combination of hardware, software, applications, and network technology. What's more, our evaluation, design, and implementation skills, coupled with our ability to take complete project responsibility, enable us to help meet your business needs on time, to budget, to specification.

With our global presence, complete range of services, proven delivery systems, and a focus on making the customer successful, we have a long list of satisfied customers throughout the world.

To find out how Computer Power Group can make a world of difference to your next project, call (508) 650-3500. Or write: Computer Power Group, Americas, 24 Prime Park Way, Natick, MA 01760.



MAC
NUGGETS

Julie Pitta

An Apple
for the '90s

As Apple faces the challenge of evolving Macintosh technology, it does so with a team of executives who are learning to love the Mac.

Apple in 1989 bears little resemblance to the rag-tag company founded in a garage by Steve Jobs and Steve Wozniak. The engineers still wear T-shirts and jeans, and you can still find inflatable beach toys in their cubicles. It's the look in the executive offices that has changed. There, you'll find a group of gray-templed, blue-suited executives who wear blue jeans on Fridays only.

The transformation has been by design. Apple Chairman and Chief Executive John Sculley realized that Apple needed to change its image if it was to be taken seriously by Fortune 1,000 customers. He realized that a blue suit feels more comfortable talking to another blue suit when he's doing business.

The departure of Apple Senior Vice-President of Sales Chuck Boesenberg represents the latest in what has been a series of exits by Apple veterans. Most notably, Del Yocam, one-time Apple veteran and Chief Operating Officer, has announced his resignation, effective later this year. Debbie Coleman, Apple's chief financial officer, has said she will take a leave of absence, eventually returning to Apple in a position of less responsibility a few months from now. Like Yocam, Coleman

Continued on page 48

Esber stands firm behind Dbase lawsuit

IN PERSON

Late last year, Ashton-Tate Corp. stunned the personal computer world when it sued Dbase cloner Fox Software, Inc. for copyright infringement. The firm must have known that suing a vendor of a popular, high-performance database management system would create a serious backlash.

Simply put, customers like price competition and product choices and do not like lawsuits that seem to be aimed at stifling competition. Complicating matters, Dbase author C. Wayne Ratliff has claimed that Dbase was derived from a DBMS that is essentially in the public domain and not proprietary to Ashton-Tate.

But vendors are not customers and clearly have a different set of goals, such as market share and return on investment. It is this very different set of goals that has prompted Lotus Development Corp., Apple Com-

puter, Inc. and, recently, Ashton-Tate, to sue firms that produce software too much like the original.

Computerworld Senior Editor Douglas Barney spoke with Ashton-Tate Chairman Ed Esber, who defended his company's actions and explained his organization's rationale for the lawsuit.

You have sought to protect the Dbase language from infringement, but so far, no court has ruled that languages are protectable.

There is no legal precedent to indicate that the language can't be protected. This is an integral part of the Dbase product. I do get upset when I read almost every article on this thing that makes a blanket statement that languages are not protected or aren't part of the copyright law. That is blatantly not true.

The language is ours. We created it. A minute part of it does



Ashton-Tate's Esber

include other public-domain software that under law we can incorporate.

I find it highly ironic that Wayne Ratliff — who several years ago was trying to sell [Dbase] and become an employee of Ashton-Tate — represented certain things and was given \$15 million to \$20 million dollars. Now as a competitor, he suddenly claims that the whole thing was derived from public domain and is not ours. I would be happy to take a refund if he is basically saying that he took it.

What is the distinction between taking elements and concepts from others — and using them to the benefit of users — and outright stealing?

The courts have ruled on a specific thing like that. Everybody clearly has the right to survey the competition, listen to their customers and to incorporate, in some manner, capabilities derived from customer input.

Fox has made several statements asserting that we "copied a few features from them," and I have stated on many occasions that I hope they win. If they win saying that we took three features, they make our case that they stole 997 features.

Hasn't Ashton-Tate borrowed some of the concepts and methodologies pioneered by others for use in Dbase IV?

There are very few things that the Dbase clone vendors pio-

Continued on page 48

Atlanta tests laptops
and curbside clinicsBY WILLIAM BRANDEL
CW STAFF

Health care agencies face nearly insurmountable odds in trying to medically treat the growing U.S. homeless population. This is namely because few street people regularly go to health clinics or attend the same one more than once.

But a social service agency in Atlanta hopes to give the homeless a better chance of receiving vitally needed medical treatment by putting a squad of mobile health clinics, backed by personal computers, on the streets.

Although the mobile unit program has not been fully implemented, community health service coordinator Bob Stokes said the computer technology has worked successfully in field

tests. While there are no guarantees that the agency will eventually treat a majority of Atlanta's sick and injured homeless individuals, what was once impossible can now at least be attempted, thanks to computer technology, he said.

The computerized

tracking effort is the first of its kind, according to Stokes. "Birmingham does data input on a computer, but we're the only ones I know of who are working with a phone line, modem and PC for on-line access to a homeless person's records," he said.

Three mobile units — each with a doctor, a social service case worker and a driver who assists with medical attention and medical supplies inventory —



bring health care to the curbside. Each member of the group assists in the street patient's treatment. The members then update the patient's record on their own

PCs. The data is then transmitted to a central computer site.

The community health services group's mission is to track and medically treat the 10,000 to 12,000 sick and injured homeless people in Atlanta.

Cross-reference

"Because they are migratory, we have no clear census of how many of them are out there or how many are sick," Stokes said. "We only know how many ill ones come in to be treated. Without a computer to cross-reference their files, we can't keep track of them."

Stokes said that the homeless who arrive at the clinics most often need treatment for serious problems, such as respiratory illness, influenza, substance abuse and mental illness.

Continued on page 50

Graphics aid in software development

BY MICHAEL ALEXANDER
CW STAFF

AUSTIN, Texas — Bringing end users into the application development cycle too late can lead to costly misunderstandings of their needs. Conversely, bringing them in too early often leads to costly delays.

Syscorp International's Microstep promises to speed application development and allow end users to become involved in the process virtually from the beginning.

Microstep ("step" stands for Specification to Executable Program) is a computer-aided software engineering product that

Syscorp's Microstep

Price: \$5,000

- IBM PC AT compatible
- Requires 640K bytes memory, DOS 3.1 to 3.3, 20M-byte hard disk

produces executable C language programs directly from graphical specifications.

The product is designed to improve software development productivity using four basic features: an interactive graphics design environment, automatic specification analysis, generation of executable code and production of high-quality technical

documentation.

Unlike conventional programming tools, which require the developer to describe the operation of an application in words, Microstep makes use of intelligent graphic symbols that enable the developer to draw the application.

Microstep then automatically produces an executable program as well as system documentation directly from the complete specification. According to the company, C language programs generated with Microstep are 100% executable.

"In our initial use of Microstep, we completed a 160-hour

Continued on page 49

SOFT TIPS

Not so fast

Fifth Generation Software's Fastback is a handy disk backup utility but only when the proper version is installed correctly. Here are a few tips:

Version 5.15 of Fastback is designed specifically for PS/2s. If you have a laptop with a 3½-in. floppy drive, you need Version 5.14 in 3½-in. format. If you install Version 5.14 on a laptop, make sure you do not install it for an AT compatible.

If you are using Fastback on an 80386 machine, you may have problems running the DMA test. If so, the clock speed in the 386 machine is too fast for Fastback. Type MODE SPEED=FAST and run Fastback again. Set the speed back by typing MODE SPEED=AUTO.

Information provided by Corporate Software, Inc., a Westwood, Mass.-based software reseller.

Is it Safe?



North Africa...U.S. paratroopers on the way to their next mission. (Credit: International News Photos)

**Would You Like to
Know a Way to Make
Risk-free Decisions
About Buying
Mainframe Software?**

Buy from On-Line Software—the safe buy in mainframe software.

On-Line Software is “the safe buy” because it’s the first and only company to offer you a lifetime guarantee that the money you spend with us today will still be available to meet your changing needs tomorrow.

No more waiting on vendors’ promises for the ultimate solution—take advantage of today’s technology today! IBM® and others may be addressing the “big picture” of tomorrow, but

The Guarantee.

Any time your technical or business needs change and you can no longer use one of our products—or even if you just decide you don't want it anymore—you can simply send it back. We will give you full credit for every dollar of your original license fee toward any other On-Line Software product. All products licensed and maintained under our standard contracts come with this trade-in guarantee.

our software solves your problems today. It's simple. If tomorrow's solutions make today's problems obsolete, send us back our software and trade it in for any other product we offer. And while other vendors develop their solutions, you will be benefiting from the use of ours.

Let's say you migrate from IMS to DB2. Simply trade in our IMS tools for our new DB2 tools. It's as if you could suddenly trade in all your records for compact discs! And, of course, you'll

have our broad array of software products to choose from.

In fact, only two companies—IBM and Computer Associates—offer a wider range of IBM mainframe software than we do; but neither one has our products, nor offers a similar guarantee.

It's like a lifetime trial. Think about it! Any reputable software vendor will offer you a 30-day free trial and a guarantee that the software will perform as expected. But what we are offering you is more. Our guarantee is our promise to you that our software will always be state-of-the-art, and that we'll work so hard to please you that you'll never have a reason to return an On-Line Software product.

So the next time you are evaluating software for your company, ask yourself the question, "Is it safe?" We can't guarantee that technology won't change, but we can guarantee you the purchasing power to change with technology. And we feel safe in making that statement, simply because our software is that good! Just think. If we didn't have complete confidence in our products, would we make this kind of guarantee?

For "the safe buy" in software, call 1-800-642-0177. In Canada, call 201-592-0009.

 **On-Line Software**
INTERNATIONAL

The Safe Buy in Software.

Esber stands

CONTINUED FROM PAGE 45

needed that weren't common in either mini or mainframe databases of computer science for the last 20 years.

For example, SQL is a language that you have taken.

IBM specifically took action to place that in the public domain. There is nothing to say a language is not protectable. For the languages we are used to dealing with in the computer world — Basic, Cobol, C — actions were taken by the inventors or institutions that created them to purposefully put them in the public domain.

We have always asserted that the lan-

guage is an important element of our proprietary right, and we intend to protect it.

Some people are giving us a hard time for not filing the suit earlier. We do not use the courts lightly. We took several actions in other manners besides the legal system to assert our rights, but nobody listened to us.

What about Wordtech? Aren't they immune from a lawsuit because they sold you technology?

We believe Wordtech is substantially overstating the effect of that release. We have provided that release only to Wordtech and to no one else. The release pertains only to Wordtech problems that existed in 1987 and subsequent versions of those products so long as they haven't

been substantially modified. Dbase IV is not a part of that release. We are watching Wordtech very, very carefully to see what kind of products they bring out.

What about the IEEE standards committee that is hoping to standardize the Dbase language?

My statement to them is that if this committee wants to create their own database language, that is great. But since we believe Dbase is ours and protectable, they can't use the name Dbase and can't use the Dbase language.

Because the court has not ruled on language protection, clone vendors face a period of uncertainty. Is that using the court to lock these

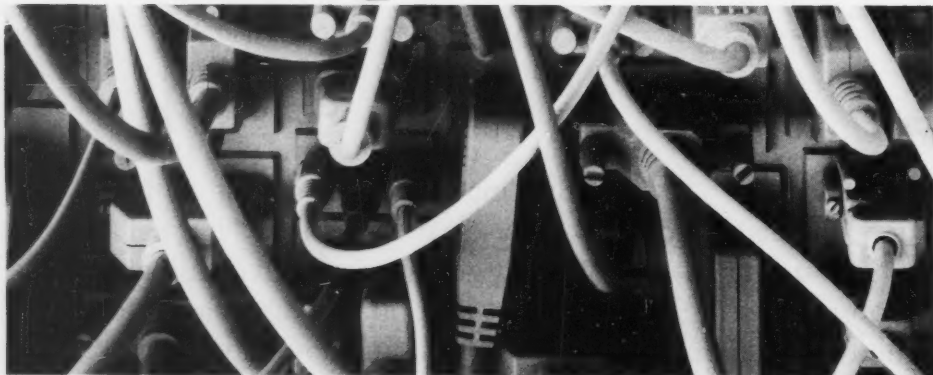
people out of particular markets? We do not use the court system to in any way harm legitimate competition.

Let's assume Ashton-Tate prevails. What is the benefit for the customer?

The first time any two people file a lawsuit who in some manner appear to be competing, somebody sticks the consumer up, wraps them in an American flag and says prices are either going to go up or technology will not move forward. Arguing against either of these issues is like arguing against apple pie and motherhood.

Users will benefit because firms that take risks are ultimately rewarded and will ultimately continue to take risks and bring new things to the market.

Beat those multi-vendor technophobia blues.



The symptoms are easy to spot.

You approach your exec V.P. with an information proposal. I's dotted, T's crossed. Everything's buttoned up, right down to the last byte.

He's impressed, but maybe a little overwhelmed by all those vendors.

NYNEX can chase those technophobia blues away. For good!

Our Single Source Solutions quickly answer your company needs.

Teams of professionals from the NYNEX family of companies help you create cost-effective, customized solutions. In the process, we use the finest, most reliable products and services from a variety of major manufacturers.

If your company needs a private communications network, NYNEX will work with

you to evaluate, design, install, and maintain a leading-edge system.

NYNEX can implement advanced information systems for banking, brokerage, manufacturing and insurance. We work side by side to create management systems, field service systems, even integrated systems overseas.

See why the answer is NYNEX. Communication Networks '89, Booth 722.

The search for your NYNEX value-added information answer begins at CN '89.

Just look for the booth with Single Source Solutions.

Need to communicate? Need to compute? The answer is

NYNEX

Pitta

CONTINUED FROM PAGE 45

is an Apple veteran, originally hired by cofounder Steve Jobs as controller for his favored Mac division.

Coleman's sabbatical is attributed to health problems. Evidently, the stress of her career has taken its toll. However, she insists that her future is still with Apple. Eventually, she hopes to head an Apple spin-off like Claris.

Yocam's departure is not as easy to explain, although he insists that the decision is his own. In one of Apple's many reorganizations last year, Yocam took a backseat to newer faces. Allen Loren, a former MIS executive at Signa Insurance, who at the time of the reorganization had been on board for less than a year, became president of Apple USA. Yocam was given the Apple Education division.

Boesenberg leaves at a time when the industry is rife with rumors that Loren is handing out pink slips to many Apple veterans. Boesenberg will become a senior executive at Mips Computer Systems, Inc. in March.

The announcement of his resignation comes only weeks after John Scull, who headed Apple's desktop publishing group, left the company to become president of Apple third-party software developer, Macromind.

The change at Apple is not uncommon. Leaders tend to hire and promote in their own image. Like Apple Chairman Sculley, Loren is a member of the East Coast establishment.

Replacing these old-timers are a group of seasoned executives. However, their experience is with Microsoft MS-DOS-based systems. Gerry Malec, Apple's vice-president of business marketing, and Donald Casey, vice-president of networking, are both former IBMers.

These and other Apple executives will be responsible for moving the Mac forward. Jobs had a point when he called the Mac "a technology of the '80s." The Mac's operating system sorely needs to be updated: It lacks the multitasking capabilities that OS/2 with the Presentation Manager will offer. OS/2 with the Presentation Manager takes the Mac's advantage — a graphical user interface — and does it one better with more power.

The challenges are formidable. The question remains whether a team of new Mac converts can restore Apple's reputation of being a technology leader.

Pitta is *Computerworld's* West Coast senior correspondent.

Graphics aid

CONTINUED FROM PAGE 45

application development effort in 10 hours," said Jules Ghedina, principal-in-charge of Peat Marwick Main & Co.'s national technical center based in Montvale, N.J.

"This initial high productivity, combined with the product's design and validation feature, makes it desirable for us to use Microstep on consulting engagements requiring PC application software development," he said.

Syscorp and Peat Marwick recently signed an agreement that calls for the latter to provide implementation assistance, training and custom application development services for Microstep.

An analyst or programmer can use Microstep's mouse-driven, graphic specification environment that features five sets of design tools to build data flow diagrams, layout screens and format reports as well as describe the application's computations and other activities.

Resists inconsistencies

Elements of a design specification reportedly can be copied and stored in a data dictionary for use in other specifications, helping to reduce design inconsistencies resulting from redundant development efforts.

The Texas Water Commission in Austin has been using Microstep to develop stand-alone prototype applications. These applications will be used by individual end users in satellite offices to compile data related to water quality and hazardous waste at various sites, said John Wilson, manager of the applications development center.

In a pilot program soon to be under way, end users will receive an application written with Microstep that will be used to tabulate and print data gathered during field inspections.

However, end users will have to send the disks to commission headquarters on a monthly basis rather than upload the information electronically because Microstep is not designed for use on networks, Wilson pointed out. The lack of a networking version is a critical limitation to the product's viability for the water commission, he added.

"We have some other questions about it — for instance, in a tutorial application we're working on — but the folks at Syscorp have been responsive," Wilson added.

In development

A network version is in the development stage and will probably be available this summer, according to a Syscorp spokesperson.

Microstep runs on an IBM Personal Computer AT or compatible equipped with 640K bytes of memory, a 20M-byte hard disk, DOS 3.1 through DOS 3.3, an IBM Enhanced Graphics Adapter or Hercules Computer Technology, Inc. video card and a Microsoft Corp.-compatible mouse. The company's suggested list price is \$5,000.

"The price is probably a little high for its capability because it is basically a single-user product at this point," Wilson said. "But being able to make unlimited runtime copies justifies the price for us. It meets the bill, as we think it will be used by hundreds of people" in the satellite offices.

Macworld Expo

CONTINUED FROM PAGE 43

year's Macworld. It also marked Lotus Development Corp.'s reentry into the Macintosh product world with a revamped version of its original Mac software package called Jazz.

Modern Jazz, an integrated software program that debuted three years after the introduction of Jazz, was supposed to be free of the problems that sunk the original program while also adding new capabilities. However, the updated version has proved to be an even bigger failure than its predecessor. According to Infocorp, a Cupertino, Calif.-based market research firm, an estimated 115,500 copies of Jazz

were sold — well below Lotus' expectations.

Modern Jazz never shipped. Months after its Macworld debut, it was scrapped amid reports that Lotus could not resolve some technical problems in the program.

Other products that debuted at last year's Macworld have fared better than Modern Jazz. Apple introduced three laser printers to replace its older Laserwriter and Laserwriter Plus models. The products were an attempt to renew Apple's commitment to the desktop publishing market.

Powered by a new Canon USA, Inc. engine, the new printers were said to offer up to four times the speed of Apple's older products and three times the print life.

The printers have been well received,

according to Robert Fennell, an industry analyst at Dataquest, Inc., a San Jose, Calif., market research firm. They boasted features like improved paper-handling capabilities and more fonts, he noted.

However, the products were affected by a shortage of memory components. The entry-level model, the Laserwriter SC, comes standard with 1M byte of random-access memory. The mid-range model, the Laserwriter NT, and the high-end product, the Laserwriter II NTX, are sold with 2M bytes of RAM as standard features.

The dynamic RAM scarcity forced Apple to raise product prices last September. However, Fennell said Apple was able to maintain its share of 10% to 15% of the laser printer market in 1988.

Are you Managing Micros by the Books?

The major PC trade journals agree that The Micro Resource Manager (MRM) is the recognized standard for professional micro management. MRM has earned the universal praise of micro managers, MIS directors, and software experts worldwide.

Here's what the "books" are saying...

PC WORLD

"The beauty of MRM is that it serves as a self-contained environment for the business of micro management. . . . MRM is well conceived and designed, packing a great deal of power and flexibility. . . ."

PCWEEK

"Overall MRM is highly complex and powerful, but it's ease-of-use factors make accessing the valuable information it contains surprisingly easy." MRM "makes the task of tracking PC equipment not only possible, but also highly efficient and effective. . . . It is hard to imagine a system that would make those tasks easier."

INFO WORLD

"MRM does everything you could possibly want from a product like this and more. . . . valuable, well-thought-out, and very powerful specialized database system for microcomputer managers."

LAN TIMES

Named MRM to their 1987 top 10 list of multi-user applications.

MRM—A TOTAL SOLUTION

MRM is the most comprehensive and sophisticated software available for managing, supporting, and analyzing the use of microcomputers. Track hardware, software, peripherals, or services—by item or by system. Track PC's, minis, or mainframes. Analyze budgets and trends. Send memos to selected users. Log, track, and cost user requests for support.

Over 200 reports and queries provide fast and flexible access to essential information in these key areas:

- Inventory Tracking
- On-line Tech Notes
- Configuration Management
- Network Config. Mgmt.
- Maintenance Management
- Problem Tracking
- Purchasing & Receiving
- Management Reporting

MRM has the features you need for increased efficiency and greater control. MRM also provides the high-level analysis of costs and use that management requires for strategic planning and long-term forecasting.

A FOURTH-GENERATION APPLICATION

Written in PROGRESS, a fourth-generation, relational database MRM's advanced user interface takes power and ease-of-use one step further than ordinary applications. Menus, windows, function keys, record scrolling, and "zoom" keys provide rapid cross-searching of data and effortless navigation through multiple data files. Rigorous data validation, automatic data base recovery, and multi-level user security ensure system integrity. Multiple report sequences and flexible selection criteria provide powerful ad hoc reporting. MRM is currently available on single-user MS-DOS, multi-user LANs, and VAX VMS.

GET INFORMATION FAST

With MRM's "borderless" database navigation, detailed information is always only seconds away. Imagine scrolling through a list of PC configurations, selecting the specific configuration you're looking for, and "zooming" into a summary of the components in that configuration. Then imagine selecting a specific component and "zooming" into the detailed inventory record. All the information you need—warranty, maintenance, purchasing data, etc.—is now at your fingertips. Finally, with a single keystroke, you can reassign that component to another configuration.

Call or write today for our FREE demo disk. Or better yet, order our one-hour MRM video.

The Micro Resource Manager™

COMPUTER ASSOCIATES
Software superior by design.

200 West Lowe Ave., Fairfield, Iowa 52556
(515) 472-6400

PROGRESS
is a registered trademark of Progress Software Corporation

These are just some of the organizations that have discovered the TOTAL solution to managing micros:

Abbott Labs
Air National Guard (77 sites)
Alcan Aluminum
American Airlines
American Reinsurance
Ashland Chemical
Bankers Trust Co.
Barclay's Bank
Baxter Hospital Supply
Bechtel
Blue Cross/Blue Shield
Cargill, Inc.
Caterpillar
Chase Manhattan Bank
Chemical Bank
Ciba-Geigy
Coca Cola Co.
Cortel
Cullum
EPA
FBI
FMA
FBI
General
Grumman
Honeywell Inc.
Hydro Quebec
IBM
ITT
James River Corp.
Lear Systems
Library of Congress
Los Angeles Times
Manufacturers District Affili.
Marine Midland Bank
Mellon Corporation
Merrill Lynch
NADAC
NASA
Naval Academy
Naval War College
NBC
Nordstrom
North American Philips
Orion Pictures
Pepperidge Farms
Pepsi Co.
Prudential Backs
Royal Insurance
Satchi & Satchi
Salem Brothers
Scott Paper
Sealed Air
Sovran Financial
Statistics Canada
Super Value Stores
Time Inc.
Tape TV, Inc.
United Airlines
Upjohn
US Army Corps of Engineers (33 sites)
US Dept. of Agriculture
US Dept. of the Army
US Dept. of Defense
US Dept. of Labor
US Marine Corp.
U.S. Navy

Barney

CONTINUED FROM PAGE 43

company failed completely to respond to the need for compatibility.

That wave flattened out before it hit the shore.

The next wave started to form in late 1986 and was called Vaxmate. This machine was IBM compatible and added advanced communications with DEC VAX minicomputers. But the machine was expensive, provided no color and needed an add-on chassis for slots and a hard disk. This add-on often overheated and melted and was perhaps most useful for informal office barbecues. I could make a bigger wave in my bathtub.

Now we come to the third wave. Here, DEC has formed an alliance with Tandy to resell Tandy machines and has introduced new workstations. The workstations are for sophisticated engineering-type users, and because of their high cost and marginal compatibility via emulation, they won't impact the PC market.

The Tandy PCs will come in handy for one thing only: to sell to customers who have DEC minicomputers and would be happy to buy all their equipment from the same salesperson.

The only problem is, there probably aren't many of these folks. Most corporate users have established so-called PC standards, usually IBM, Compaq and a little bit of Apple. Why would they add Tandy, a company they probably have

never dealt with, to their list?

DEC has made a couple of things clear. It probably won't build its own PCs anymore. It will also try its best to support machines from other vendors so it can sell more minicomputers.

But this does little to face up to the long-term problem of PCs cutting into minicomputer sales. As this trend continues and as DEC continues to wallow in the PC business, this may be the most serious threat ever to DEC's health.

Jobs speaks, but wished he hadn't. Years ago, when Microsoft first showed Apple its Excel integrated spreadsheet, then-Apple Chairman Steve Jobs reportedly scoffed. Jobs just didn't think the typical Mac user would want rows and col-

umns. Wrong! Excel turned out to be the most important Mac application ever. Now Jobs thinks his Next machine doesn't need a floppy disk drive. Hmmm.

You thought the Pakistani virus was bad? The so-called Vienna virus is making its way from Europe to the U.S. and is expected to hit hard in a few short months. This little nasty uses Boolean logic and modulus arithmetic to work its magic. Once triggered, the virus rewrites the first five bytes of a program's .EXE file, rendering it useless, according to Harold Highland, editor in chief of *Computers & Security* magazine.

Barney is a *Computerworld* senior editor, micro-computing.



IS THIS YOUR LINE OF ACTION?

If the telephone is your line of action, one of the ways to keep information moving up that line is through voice processing.

And if you need to know more about voice processing, there's no better place than Wang Information Services Corp. (WISC).

Whether you're a small company or large, one thing's for sure. Wang Information Services Corp. can meet your voice processing needs today and tomorrow—all the way up the line.

How? By offering what you need when you need it.

Like our DVX® Voice Mail and Voice Update Services, two applications that can improve the flow

of communications within your business and quickly put information in the hands of those who need it. And what's more—all you need is a telephone to use it.

Or like our hardware, for flexibility only hardware can provide. You can either buy it and run it yourself, or you can let us do it. It's your choice. That's the way it should be.

So whichever way you want to go to improve voice communications within your company, Wang Information Services Corp. is there with you. For consultations, for support, for the long run. To keep your line of action moving.

For more information call 1-800-TEL-WISC.

WANG

Wang Information Services Corp., A subsidiary of Wang Laboratories, Inc., One Industrial Ave., Lowell, MA 01851. DVX® is a registered trademark of Wang Laboratories, Inc. © 1988 Wang Laboratories, Inc.

Curbside clinics

CONTINUED FROM PAGE 45

To help monitor a homeless person's medical treatment and ensure that he or she receives the proper medication, the group uploads information from a database that cross-references each social worker's input.

According to Bob Mead, president of Lifecare Technologies in Atlanta, these systems can be used by workers who do not know how to use a PC. "Because the PCs are so simple to use, even a volunteer can come in and update a record," he said. "It helps give their program a sense of continuity." Lifecare Technologies donated the technical and consultant resources to develop PC software applications for the health care agency.

End users first enter data into The Write-Top from Linus Technologies, Inc. in Reston, Va., by writing with an electronic pen on an LCD screen instead of typing in information. The screen also displays data requested by the user.

When the user writes on the 80- by 25-character screen, a transparent digitizer interprets the input and converts it into digital signals. The signals are then converted to ASCII to resemble input from a keyboard.

The request or entry input is then uploaded to the home-base computer by modem over a private branch exchange telephone line. The medical files are stored in a database on a Hewlett-Packard Co. minicomputer.

Magellan

CONTINUED FROM PAGE 43

out the relevant portions of each file to see trends or write a memo to a dealer asking for better terms.

The product is clearly aimed at today's character-oriented environment and effectively reads files from Lotus' 1-2-3, Symphony, Agenda and Manuscript, as well as Wordperfect Corp.'s Wordperfect, IBM's Displaywrite, Ashton-Tate Corp.'s Dbase and Multimate, Microsoft's Word and Micropro International Corp.'s Wordstar.

The Magellan system reportedly works less well with graphically oriented programs that use bit-mapped images, such as Microsoft's Windows applications. However, users of these types of programs are able to read the text contained in these bit-mapped files, according to Lotus officials.

NEW PRODUCTS

Systems

Profit Technology, Inc. has announced the **Pro/One Model 35** business computer.

The unit is based on a NEC Corp. V20 processor running at either 4.77 or 10 MHz and can be configured with 640K bytes of memory. Options include an Intel Corp. 8087 math coprocessor, 3½- or 5¼-in. floppy drives and 20M-, 40M- or 80M-byte fixed disks.

A basic system with 256K bytes of random-access memory, one 1.2M-byte 5¼-in. floppy drive and a monochrome monitor costs \$795.

Profit Technology, Pro/One Division, Suite 1441, 17 Battery Place, New York, N.Y. 10004. 800-223-4628.



Profit Technology's Model 35

Software applications packages

Certiflex Corp. has released **Version 5.0** of its **Certiflexplus Client Write-Up** system.

The program has reportedly been enhanced to provide a 250% speed increase over the previous version. The Certiflexplus system also offers on-line Help and 13 period and data file conversions for all existing client files, according to the company.

The Certiflexplus Client Write-Up 5.0 costs \$995. Current users may upgrade for \$245.

Certiflex, 12920 Senlac Drive, Dallas, Texas 75234. 800-237-8435.

A program for sales and marketing managers using IBM Personal Computer XTs, ATs and compatible systems has been announced by **Technical Sales and Marketing Associates**.

The **Sales Source Manager** reportedly maintains separate databases for sales leads territories and addresses, advertising sources and product descriptions. Report- and label-generating capabilities are also included.

The package is priced at \$249.

Technical Sales and Marketing, P.O. Box 8655, Fountain Valley, Calif. 92728. 714-968-9838.

Left Coast Software has enhanced its check-writing and personal accounting program for IBM Personal Computer and compatible users.

Exchequer Version 2.0, designed to automate the billing process in small businesses or offices, requires 230K bytes of available memory and one floppy drive. The software reportedly supports

any printer that can handle continuous-feed checks and is priced at \$49.95 plus \$3.00 shipping and handling.

Left Coast, P.O. Box 160601, Cupertino, Calif. 95016. 800-234-0554.

An occupational analysis and job matching system designed for personnel departments, employment agencies and career counselors has been announced by **Sophisticated Software Development, Inc.**

According to the vendor, **Majic** can generate employer listings, job orders, job listings, occupational analysis and client ability profiles. The software is priced

at \$2,000 per workstation.

Sophisticated Software, Suite 220, 8625 S.W. Cascade Ave., Beaverton, Ore. 97005. 503-641-4900.

A business forecasting software package has been announced by **Concentric Data Systems, Inc.**

Trendsetter Expert was designed for sales forecasting, expense projection and inventory planning, according to the vendor. The product reportedly works as an add-in with Lotus Development Corp.'s 1-2-3 Releases 2.0 and 2.01 and Symphony Releases 1.1, 1.2 and 2.0. A hard disk is required for operation.

Trendsetter Expert costs \$149.

Concentric, 18 Lyman St., Westboro, Mass. 01581. 508-366-1122.

Tarbell Electronics has announced a database system that offers drawing and picture graphics as a field type, the company said.

The **Datasketch** system reportedly includes numeric, character, data, multi-line and sound charts and built-in art capabilities. The program requires IBM PC-DOS or Microsoft Corp. MS-DOS 3.00 or higher and an IBM Color Graphics Adapter, Enhanced Graphics Adapter or Hercules Computer Technology, Inc. display, the vendor said.

The \$99 introductory price includes sample programs and files and is not copy protected.

Tarbell, Suite C, 1082 E. Artesia Blvd., Long Beach, Calif. 90805. 213-422-7081.

A MILLION COBOL PROGRAMMERS ARE A TERRIBLE THING TO WASTE.

It's been fashionable to change languages when you develop for the personal computer. This turns experienced programmers into beginners, and adds a small step called "rewrite the whole system" to each development project. The effect on budget, schedules, standards and staff is painful—and unnecessary.

Realia offers full PC emulations of the tools you know: Realia COBOL, RealCICS, RealDL/I. With no conversion and no retraining, you can move big existing systems to the PC for development, then upload them to the mainframe—or leave them on the PC—for production.

With Realia, COBOL becomes for the PC what it has always been for the mainframe: powerful, flexible, and above all maintainable. Realia's compiler generates highly optimized machine code, with speed and compactness unmatched among PC COBOLs. You get the performance levels of Pascal or C, without the cryptic operators and the learning curve.

Realia also ends your frustration with mainframe programming utilities. Ours are fast, intuitive, full-screen and full-color. From screen manager to BMS map editor to source-level debugger, these tools eclipse anything available on the mainframe.

See for yourself. Call for a free 30-day evaluation.

REALIA®

10 South Riverside Plaza, Chicago, IL 60606, 312/346-0642
34 North End Road, Hammersmith, London W14 0SH, England, 01/602-8066

Software Publishing Corp. and Autographix, Inc. have announced the start-up of the Autographix Overnight Slide Service for users of Software Publishing's Harvard Graphics software package.

The service reportedly permits Harvard Graphics users to transmit files via modem to authorized Autographix Service Centers and receive 35mm

slides, color overhead transparencies or color prints within 24 hours. The current charge for same-day service and remote 24-hour turnaround is \$12 per color slide. Users of Harvard Graphics 2.1 can receive an overnight slide service kit free of charge by calling 800-548-8558.

Autographix, 100 Fifth Ave., Waltham, Mass. 02154. 617-890-8558.

Software utilities

Group L Corp. has reduced the price of its full-text retrieval program for IBM Personal Computers and compatible systems.

Designed to transform individual PC files into free-form databases for easy searching, **Memory Lane**, formerly priced at \$149, is now available for \$99.

The information management utility can reportedly locate text or numbers stored anywhere on a hard disk.

Group L, 481 Carlisle Drive, Herndon, Va. 22070. 703-471-0030.

K-Talk Communications, Inc. has announced a graphics version of its mathematical editing software.

Designed to allow users to construct math expressions for technical documents, **Version 1.1 of Mathedit** can output math equations in a .PCX graphics file, the vendor said. The product can be inserted into Wordperfect Corp.'s Wordperfect 5.0, Aldus Corp.'s PageMaker and several other programs. The package runs on IBM Personal Computers and compatibles and costs \$149.

K-Talk Communications, Suite 100, 50 McMillen Ave., Columbus, Ohio 43201. 614-294-3535.

Macintosh products

Bitstream, Inc. has announced that it will release its entire typeface library for use with Adobe Systems, Inc. Postscript PDL-based typesetters driven by Apple Computer, Inc.'s Macintosh computers.

According to the vendor, the **Bitstream Type Library for Postscript** will work with several typesetters, including Linotype's??? Lintronic and CompuGraphic Corp.'s CG 9400-PS. The first fonts are scheduled for delivery in February.

The library will be priced at \$50 per font, with a minimum purchase of four fonts, according to the vendor.

Bitstream, Athenaeum House, 215 First St., Cambridge, Mass. 02142. 617-497-6222.

DSI Micro, Inc. has expanded its range of training programs for Wordperfect Corp. Wordperfect users to include **Quick Course for Wordperfect for the Macintosh**.

The system is said to be especially suited for preparing short documents and incorporates four segments for teaching users the basics of the Wordperfect program. An Apple Computer, Inc. Macintosh Plus, Mac II or Mac SE with one 800K-byte floppy disk drive and 512K bytes of memory are required.

The software costs \$69 per unit and includes an outlined program guide.

DSI Micro, 770 Broadway, New York, N.Y. 10003. 212-475-3900.

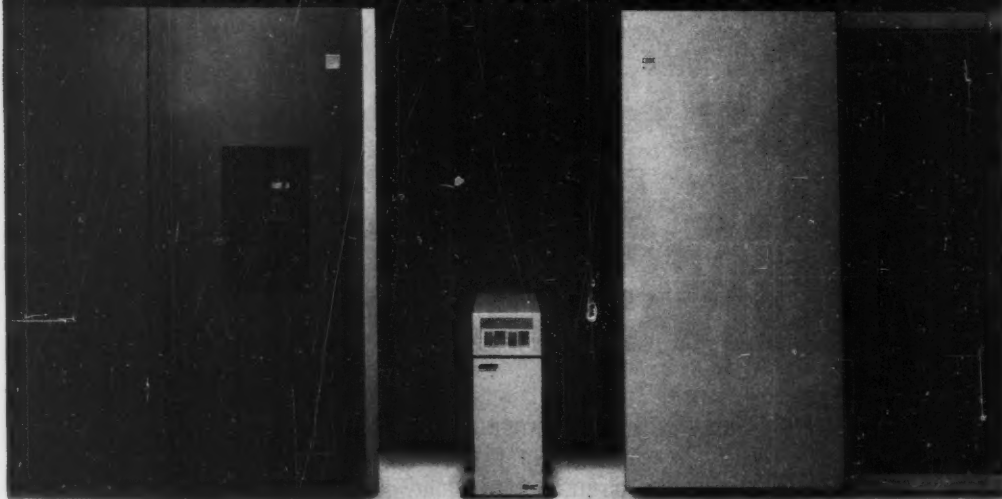
Working Software, Inc. has released a word processing package for Apple Computer, Inc.'s Macintosh machine.

Called **Quickletter**, the product can be used either as an application or desk accessory, according to the vendor, and provides the user with several letter composition and formatting features, including a page preview function.

The program requires 512K bytes of random-access memory and costs \$124.95.

Working Software, P.O. Box 1844, Santa Cruz, Calif. 95061. 408-423-5696.

EMC's ORION: The Cost-effective Solution to Your I/O Performance Problems.



EMC's ORION Solid State Disk Subsystem

Maximum Performance

EMC's ORION is the fastest solid state disk subsystem available for your mainframe computer. ORION features a technologically advanced design enabling you to receive unprecedented performance gains.

An integrated 3880 type storage director, in addition to features inherent in solid state technology, gives ORION an access time of 0.1 millisecond — a performance milestone.

What's more, EMC protects your investment by making ORION compatible with all IBM 370 and IBM PCM computers. Therefore, performance boosts are realized well into the future, when CPU upgrades become necessary.

EMC's ORION — the I/O solution you have been waiting for to maximize your system's performance and productivity.

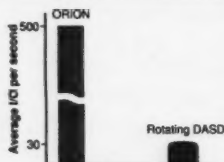
Minimum Price

EMC's ORION Solid State Disk Subsystem is the lowest cost solid state solution to your I/O performance problems. Its state-of-the-art design gives you a substantial return on your investment for years to come.

ORION's small footprint and low power requirements eliminate costly computer room renovations. Ease of installation and low cost of ownership make ORION an expedient and economical solution to your I/O performance problems.

EMC's ORION — the most economical performance boost for your current and future mainframe systems.

ORION: High Performance/Low Cost



EMC²
The System
Enhancement Company.
IBM is a registered trademark of
International Business Machines Corp.

For more information, call:
1-800-222-EMC2
In Mass., call (508) 435-1000
Copyright 1988 EMC Corporation

Crate Technology, Inc. announced it has expanded its line of internal hard disk drives for Apple Computer, Inc. Macintosh systems.

The company's Innercrate series now includes a 600M-byte drive that is compatible with the Macintosh II. Dubbed the **Innercrate 600**, the unit offers an average access time of 16.5 msec, the vendor said, and is priced at \$3,845.

A 155M-byte tape backup system for the Macintosh was also introduced. **Tapecrate 155** reportedly backs up files at 7M byte/min and offers on-screen Help information for all functions. It costs \$1,049.

Crate Technology, 6850 Vineland Ave., Building M, N. Hollywood, Calif. 91605. 818-766-4001.



Crate's 600M-byte Mac drives

Development tools

Meta Systems Ltd. has announced a Microsoft Corp. PC/Windows computer-aided software engineering (CASE) tool.

Quickspec reportedly allows systems analysts and designers to use their personal computers for entering, editing and reviewing project information in an object-oriented CASE repository. The program runs under any operating environment supported by Microsoft Windows, the company said, and requires 640K bytes of memory, a hard disk and a mouse.

Quickspec is priced at \$3,500 and is scheduled for February delivery.

Meta Systems, Suite 200, 315 E. Eisenhower Pkwy, Ann Arbor, Mich. 48108. 313-663-6027.

Gold Hill Computers, Inc. has announced **GClip Developer 3.1**, the latest release of the company's Common Lisp for personal computers.

Release 3.1 is said to offer an improved graphics environment, which includes support for the Gold Hill Windows graphics package. Enhancements also include faster and more efficient code generation, the vendor said.

GClip Developer 3.1 requires an IBM-compatible, Intel Corp. 80386-based machine with 640K bytes of base memory and a minimum of 3M bytes of extended memory.

It is priced at \$1,995.

Gold Hill, 26 Landsdowne St., Cambridge, Mass. 02139. 617-621-3300.

Training

A sales training and reinforcement series has been introduced by **Profit Technology, Inc.**

The **Sales Bible Speedtutors** are said to be DOS-based programs designed to increase selling potential by offering sales personnel short, continuous-feed reinforcement of key selling points.

The software is available in 11 different versions, each concentrating on a spe-

cific sales technique.

Each Speedtutor has a price tag of \$19.95.

Profit Technology, Suite 1441, 17 Battery Place, New York, N.Y. 10004. 800-223-4628.

DSI Micro, Inc. has announced two computer-based training courses developed for Ashton-Tate Corp.'s Dbase IV database management program.

Introducing Dbase IV: Mastering the Control Center was designed for the nonprogrammer and includes interactive practice sessions and step-by-step instructions. It is available in both 3½- and 5¼-in. formats and costs \$159.

Dbase IV: The New Features reportedly gives experienced Dbase users

an illustrated guide to the software's enhancements and modified commands and functions. Also available in 3½- and 5¼-in. disks, the product is priced at \$75.

DSI Micro, 770 Broadway, New York, N.Y. 10003. 212-475-3900.

Peripherals

Genicom Corp. has unveiled its 3410X series of business-class serial matrix printers.

The product line comprises five models: the **3410XLS**, a high-speed data and word processing printer with continuous forms handling; the **3410XLQ**, featuring a quiet enclosure; the high-speed color **3410XCQ**; the **3410XBQ** for bar-code printing; and the **3410XDQ** with Digital

Equipment Corp. LA210 emulation capabilities.

Pricing ranges from \$2,010 to \$2,600, and shipments are scheduled for the first quarter.

Genicom, Genicom Drive, Waynesboro, Va. 22980. 800-443-6426.

A nine-pin dot matrix printer has been introduced by **Seikosha America, Inc.**

Designated the **SP-1600AS**, the unit reportedly prints 160 char./sec. in draft mode and 40 char./sec. in near letter quality format. The device is compatible with Epson America, Inc.'s FX and IBM's Graphics printers.

The SP1600A costs \$329.

Seikosha, 1111 Macarthur Blvd., Mahwah, N.J. 07430. 201-529-4655.

TO HALF THE PROGRAMMERS IN THE WORLD, C LOOKS LIKE THIS:

εντελώς ασυμπίεστος

Half the world's programmers write in COBOL. Most of the world's code is in COBOL. For powerful, flexible, and above all maintainable business systems on the mainframe, COBOL has proved the best choice.

Realia brings those strengths to the personal computer. Realia COBOL generates highly optimized machine code, superbly compact and unmatched for speed. Our debugger revolutionizes the development cycle. RealCICS and RealDL/I provide true mainframe compatibility. We run on the plain 512Kb PC, and take full advantage of the high-end machines.


Some of our users are making the PC a development workstation, so a mainframe application can be downloaded without change, enhanced, and uploaded for production. These users' investment in existing COBOL systems and staff is enormous; they need the productivity gains Realia provides.

But what about the small software houses, with five or six hot programmers and total PC commitment? They're choosing Realia COBOL in great numbers, for blindingly fast executables, thorough operating-system exploitation, and add-ons like Realia ScreenIO, which cuts development time by up to 70%.

Concentrate on your new application, not a new language. Call Realia for a free 30-day evaluation.

REALIA®

10 South Riverside Plaza, Chicago, IL 60606, 312/346-0642
34 North End Road, Hammersmith, London W14 0SH, England, 01/602-8066



For CASE tools you won't outgrow, choose KnowledgeWare: Real tools for real work.

Most CASE tools look impressive when you first try them out. But many are disappointing when you get down to real work. You may be able to draw a lot of diagrams. But in one way or another, the tools prove deficient when you start building and modifying full-scale systems.

You can do better. Simply choose the tool set designed with real work in mind: the Information Engineering Workbench® from KnowledgeWare.

Real tools that can generate complete, working applications

Our PC-based tools for planning, analysis, and design let you capture all of your application requirements and specifications as diagrams. If you wish, you can then use those diagrams to *automatically* generate 100% of the COBOL source code with our mainframe applications generator, IEW/GAMMA™.

Real tools to support DB2 and other file access methods

Diagram a relational database and our tools can generate SQL DDL and DML statements *automatically*. This means that people using KnowledgeWare tools don't have to be experts in DB2. Plus, they can develop complex systems with more than one DBMS strategy. Like systems that use both VSAM and DB2, in either on-line

or batch modes. And once you have a logical data model, our tools will *automatically* transform it into a physical database.

Real tools with re-engineering capabilities you can use today

Our load utility lets you capture and reuse or modify existing IMS database definitions and COBOL data structures. Our tools can generate diagrams based on your existing IMS data definitions *automatically*. You can also load COBOL record descriptions and *automatically* create the associated data structure diagrams.

Real tools with a common Encyclopedia to ensure consistency

Since all of our tools share a common Encyclopedia, information is consistent throughout the entire development process: Any changes made with one tool are *automatically* reflected in the diagrams and definitions of the other tools. As a result, developers can focus on design instead of focusing on hunting down inconsistencies.

Real tools with the flexibility to fit your way of working

With KnowledgeWare tools, you're free to build applications almost any way you like. Ideally,

you might start with the planning tool, move to the analysis and design tools, and then produce a working application with IEW/GAMMA.

But if that's not the way you work, you can start application development with any KnowledgeWare tool. For example, you can do some design and then go back and work on analysis. Plus, you can choose from a number of the most commonly used methodologies and techniques. In short, you can put our tools to work without giving up methods that already work for you.

Call 1-800-338-4130

For more information on our Planning, Analysis, and Design Workstations, or any of our mainframe CASE tools, call our toll-free number (in Georgia, call 404/231-8575). KnowledgeWare, Inc., 3340 Peachtree Rd. N.E., Suite 1100, Atlanta, Georgia 30026.



KnowledgeWare®

*The World's Most
Comprehensive CASE Tool Set™*

NETWORKING

DATA STREAM

Patricia Keefe

Consider fiber choices



One of the barriers to fiber-optic installations has always been cost. It is not exactly cheap, and it is not for the technically unsophisticated. But it is literally the (light) wave of the future. Especially given the promise of 100M-bit Fiber Distributed Data Interface (FDDI).

Proponents of plastic fiber optics would like to alter this picture somewhat. They say they can cut the cost, offer greater tolerance and, most important, bring the camera down to the desk top. Why cope with a tangle of different wiring schemes when you can limit yourself to fiber, which promises flexibility, compactness and indifference to electrical disruptions? And why limit these benefits to campus backbones only?

Well, maybe because some observers can't see any reason not to use good old unshielded twisted-pair wire to string together work groups and departmental networks. A more secure, tried-and-true option is thin Ethernet.

On the other hand, Netronix, which introduced a plas-

Continued on page 63

Users catch on to LAN backup

BY KATY GURLEY
SPECIAL TO CW

On a routine day at Ingersoll-Rand Co.'s Baxter Springs, Kan., division, about 20 people log onto a local-area network consisting of 40 personal computers. They write reports, create painstakingly intricate graphics on computer-aided design software, retrieve and add information from a database and then store it all — without a thought about whether it will be there tomorrow.

In the course of any given week, about 220M bytes of data are stored on two hard drives and a file server on the LAN. A system crash would spell disaster — two years of data representing untold hours of work could be zapped into oblivion.

Fortunately for these users, system supervisor David Hanon

is in charge of thinking twice. And he would not dream of letting one day go by without backing up every bit of information. "We're using our computer system to run our business," Hanon says. "If you don't have data backed up, how would we run our business?"

Lack of preparation

Good question, says Bill Redman, an analyst at Stamford, Conn.-based research company Gartner Group, Inc. "I'd estimate well under 10% of LANs use a backup system," he says, basing the estimate on the fact that less than 5% of his clients in the Fortune 500 adequately back up LANs or PC drives.

Behind this nonchalance is the fact that LANs are often purchased at the department level by people who understand the need to share information but

not the importance of data security.

Redman predicts an attitude change in the next few years. For example, some MIS departments are taking over responsibility for backing up LANs from users who will not do it. And corporations are learning to protect their data as an investment, asking about backup when they buy systems.

In short, users are beginning to agree with suppliers like Gunner Bolz, president of Emerald

Continued on page 59

Can plastic cable nets cut costs?

BY PATRICIA KEEFE
CW STAFF

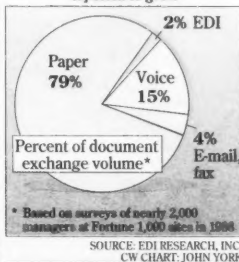
PETALUMA, Calif. — "I have one word of advice for you: plastics." Netronix must have been listening when Benjamin Brad-dock received this unexpected bit of counsel in *The Graduate*.

That was almost 20 years ago, but to hear Netronix, that tip holds particular importance for would-be fiber-optic cable users. The network supplier last week introduced Fiberstar, which it claims is the first network to support both plastic- and glass-fiber cable. Plastic fiber, according to Netronix, will bene-

Continued on page 59

Data View

Starting small
EDI's narrow share of the
document exchange market is
expected to grow



Bridges, gateways open wide at Comnet show

BY ELISABETH HORWITT
CW STAFF

WASHINGTON D.C. — Local-area network bridges and gateways, hailed by industry observers as the next phase for established LAN installations, are expected to make a big splash in the upcoming Communications Network '89 event.

LAN bridge shipments to-

taled \$83 million to \$100 million in 1987 in the U.S. and should have an annual growth rate in excess of 20% during the next few years, said Bill Redman, service director of local-area communications at the Gartner Group, Inc. in Stamford, Conn.

The following bridge and gateway introductions are expected at Comnet '89, held here the week of February 6:

• Artel Communications Corp. in Hudson, Mass., will announce Manbridge, a 45M bit/sec. version of its Fiberway 802.3 bridge, to provide a high-speed link between Ethernet LANs.

Scheduled to be available in early February, the bridge is said to provide two different types of LAN-to-LAN connection. First, it can connect multiple, geographically distributed Ethernet LANs over standard DS3 connections, as provided by AT&T and other carriers. Second, it can connect multiple 100M bit/sec. Fiberway LANs within a campus area over a 45M bit/sec. token-

Continued on page 62

Dayna offers DOS-to-Mac cheapnet

OEM version of Advanced Netware undercuts Tops and Apple approaches

BY PATRICIA KEEFE
CW STAFF

An OEM version of Novell, Inc.'s Advanced Netware could severely undercut Apple Computer, Inc. and market leader Tops at the low end of the MS-DOS-to-Macintosh connectivity market.

Salt Lake City-based Dayna Communications, Inc. is scheduled to launch Daynanet, a server-based networking operating system bundled with an interface card, by the end of the first quarter.

Dayna is claiming a marked price advantage over competitive products from Tops, a division of Sun Microsystems, Inc., and Apple.

The pricing differential, according to Dayna, is considerable. Its comparison of an equivalent configuration among the three competitors breaks down as follows:

- To support 20 users in an Apple Localtalk-only network, Daynanet requires software, an interface card and an IBM Personal Computer AT clone for a total price of about \$3,750.
- A similar Tops configuration costs \$7,800 with a server included. Tops software does not require a dedicated server, but most 20-node networks use one.
- Apple's Appleshare approach, which utilizes a dedicated Macintosh II as a server, costs \$8,100, claimed Lynn Alley, Dayna's co-founder and vice-president of re-

search and development. The hardware platform is what constitutes most of the Appleshare configuration cost.

Separately, Daynanet software costs \$1,249 per server for Localtalk, or \$1,749 for Localtalk and Ethernet. Tops software costs \$249 per node, and Appleshare, which analysts said has not been burning up the sales charts, is \$799 per server.

Network tie

At the core of Daynanet is Advanced Netware. Dayna co-developed Netware for Macintosh with Novell, which shipped last month and reportedly provides basic file and printer services to the Macintosh on an equal basis with Microsoft Corp. MS-DOS-

based computers.

Daynanet is a specially tailored low-end version that supports Localtalk and Ethernet.

Also, Daynanet file servers can be bridged via Localtalk or Ethernet cables to any of the estimated installed 300,000 Novell file servers. The interface card bundled with the operating system is Dayna's Daynataik PC Card. The server supports up to four cards or four separate networks.

Mainframe-to-Mac

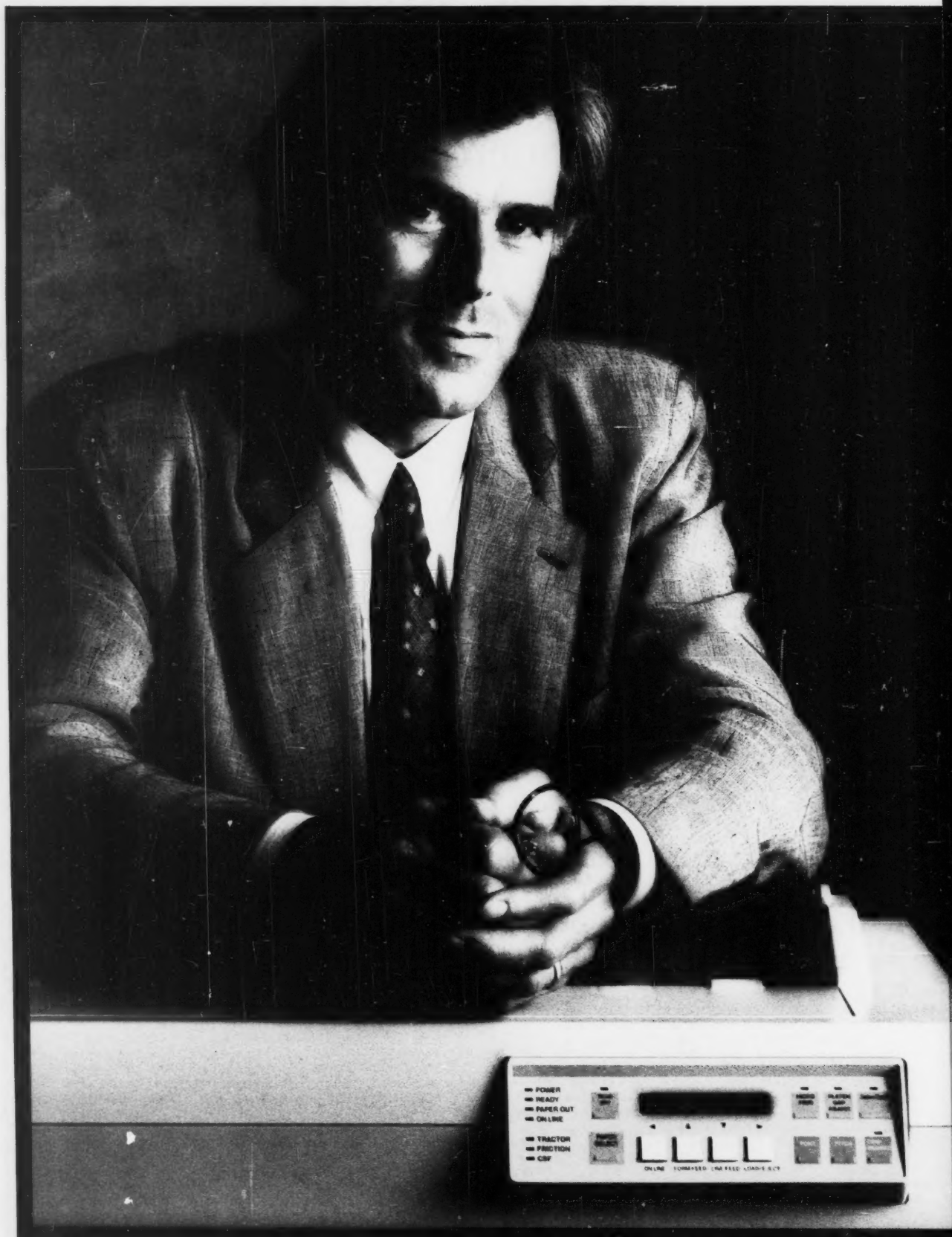
In a separate announcement, Relay Communications, Inc. in Danbury, Conn., unveiled a Macintosh-to-IBM mainframe file transfer product said to be both the first to display IBM mainframe file lists in Macintosh format and the first such link to incorporate Apple's Macworkstation development tool.

Macworkstation developers

can use Relay Baton to provide error-free message and file transfer to IBM mainframes running Relay/VM or Relay/TSO software. Relay's mainframe software serves an unlimited number of Macintoshes running Relay Baton, according to the vendor.

Because Relay Baton takes advantage of the Mac interface, files reportedly can be transferred to and from the mainframe simply by pointing and clicking on file names. This saves Mac users from having to learn IBM mainframe commands and formats.

Support for Apple's Multi-finder enables Relay Baton to execute background file transfers. The product works asynchronously over telephone lines. Scheduled to be available in February, it runs on the Macintosh Plus, SE, II and IIX and costs \$150 per unit.



Epson LQ-2550. 24-pin; 400 CPS/draft; 133 CPS/letter quality; 360 x 360 bit image graphics; 136 column carriage; short form tear-off; automatic paper thickness and top of form adjust; optional dual-bin cut sheet feeder; one year limited warranty. Epson is a registered trademark of Seiko Epson Corporation. SmartPark is a trademark of Epson America, Inc., 2780 Lomita Blvd., Torrance, CA 90505. **(800) 922-8911.**

"There's no question I wanted a letter quality printer. One with lots of typestyles. Color, if I could get it. Wide carriage. Paper handling. And controls that make it very easy to use. This new Epson I bought has it all. In fact, if this printer can't do it, you probably don't need it done."

From the leader in dot matrix printing comes the ultimate letter quality printer. The new Epson® LQ-2550. Among its many features you'll find seven perfect typestyles, high-quality graphics, built-in color and Epson's advanced SmartPark™ paper handling.

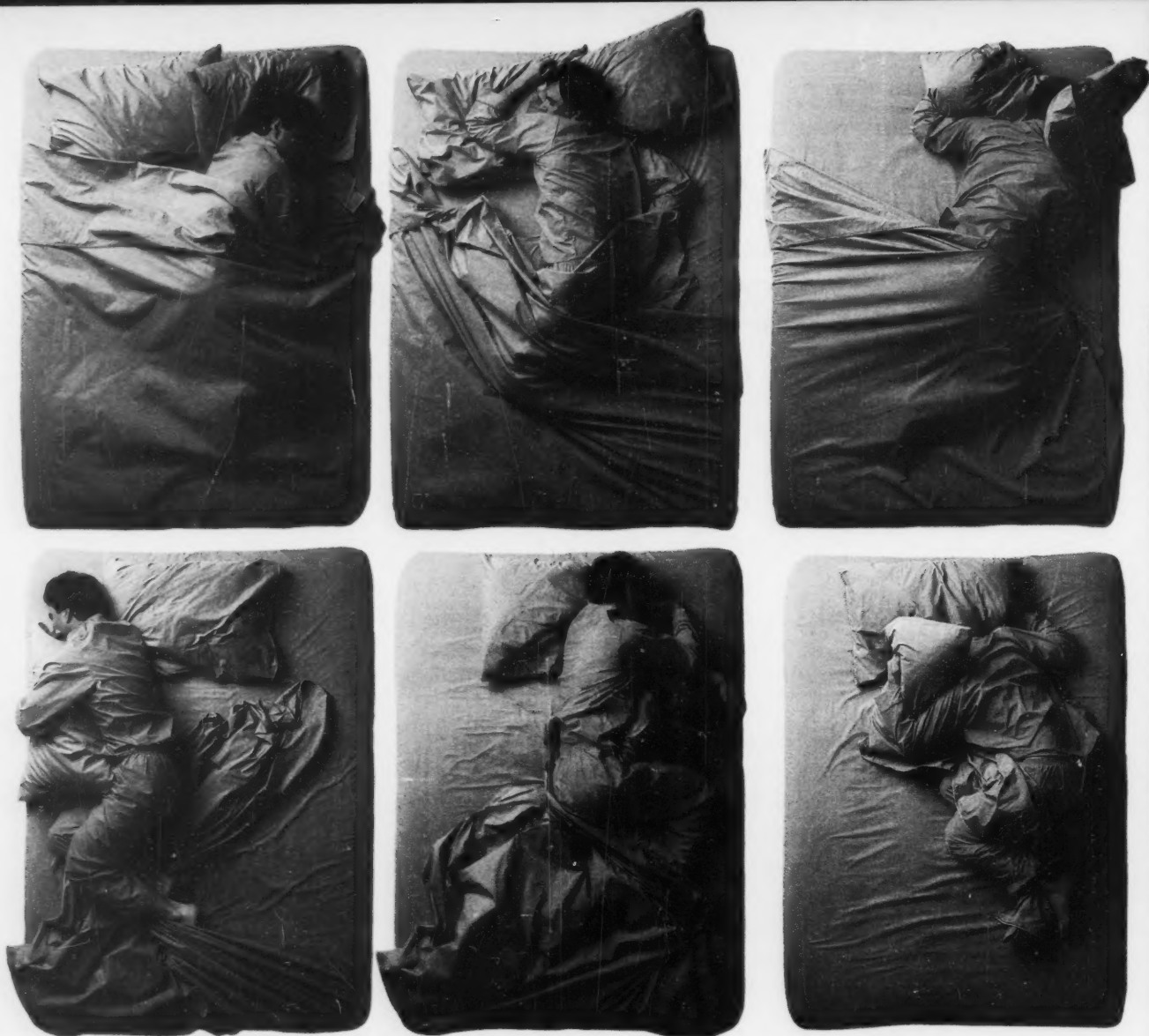
SmartPark is the easiest way ever to alternate between fanfold and single sheet paper. Or envelopes. Or even forms. And you can control just about everything with one touch of our SelecType panel.

To keep your work flowing, the LQ-2550 includes time-saving macros. Use them to pre-set your printer for the formats you use most often. Memos, spreadsheets, graphs, business letters. After that, one button is all it takes. The LQ-2550 remembers the settings for you.

In addition, the LQ-2550 comes with something nobody else's letter quality printer will ever have. Epson's undeniable reputation for reliability, performance and value. Anything less just won't do.

The Epson logo is displayed in a bold, sans-serif font. The letters are white and are set against a dark, rectangular background that has a slight 3D effect, appearing as if it's a button or a plaque.

**WHEN YOU'VE GOT AN EPSON,
YOU'VE GOT A LOT OF COMPANY.™**



This is for everyone who's been tossing around the idea of changing their network.

A network that can't keep up with your company's growth is something you can really lose a lot of sleep over.

Because there's simply too much riding on your ability to move information effectively.

Which is why you should consider Codex for your network.

For more than 25 years, the only thing we've done is networking. We've engineered many of the industry's innovations.

And we've always offered the best service and support of any networking company we know.

To find out how much we know, call 1-800-426-1212 ext. 7212.

And just think. From now on, instead of spending nights wondering how your network is going to catch up with your organization's expanding needs, you can catch up on something else. Some sleep. The Networking Experts

codex
M MOTOROLA

LAN backup

CONTINUED FROM PAGE 55

Systems Corp. in San Diego, who says, "Information on a network is more valuable than the equipment on which it resides."

It is not as if users do not have a variety of options to choose from. Internal and external backup systems offer a wide range of memory for various PC configurations.

Plastic cable

CONTINUED FROM PAGE 55

fit users in the form of easier installation and troubleshooting, greater flexibility and lower cost.

But several industry observers questioned the need for plastic fiber and its touted benefits.

Regardless of which side of the debate you are on, the issue is already moot, they claimed, given that industry leaders such as IBM, AT&T and Digital Equipment Corp. have already standardized on glass fiber, which is required under the 100M-bit Fiber Distributed Data Interface standard (see story page 55).

Netronix appears to be ducking that salvo by targeting direct connections to the desk top. Most glass-fiber networks function as campus or corporate backbones, with some installations linking departments between floors.

10M/bit Ethernet hot

Taking the opposite tact, Netronix President Art Jopling suggested that plastic fiber has the potential to supplant copper twisted-pair cable in many applications. This will not be easy: Even though it is true that twisted-pair radiates electronic signals, demand for 10M bit/sec. Ethernet over unshielded, twisted-pair cable is hot.

Undaunted, Netronix ticked off the following attributes of its 2M bit/sec. network: cheaper connectors; improved signal encoding; easier-to-see "visible" light rather than glass fiber's infrared light; low maintenance costs; extensive diagnostic and test features; an IBM Netbios emulator and Novell, Inc. Netware driver; and the ability to more tightly loop the cable in wiring closets.

Fiberstar has two major components: PC Optical Fiber LAN Adapters and Optical Fiber Hubs. The adapters transform electrical signals into light pulses and back. The hub regenerates the optical signal, increasing the distances that can be traversed.

The network supports 16 ports and reportedly interoperates with Ethernet, Starlan and broadband networks utilizing Netronix bridges. A Transmission Control Protocol/Internet Protocol package is optional. Available now, Fiberstar adapters start at \$595; the 16-port hub costs \$2,195.

Netronix claims to have eliminated one drawback of plastic fiber — limited ability to carry data long distances. Fiberstar will support spans of 500 feet between any two nodes. For longer distances, it accommodates glass fiber, which supports up to 6,000 foot distances.

Glass- and plastic-fiber technology share some attributes, such as immunity to electrical noises and eavesdropping and flexibility. Both also have a tendency to degrade after a while.

Most support the major PC LAN products such as Novell, Inc.'s Netware and 3Com Corp.'s 3+. The typical price range is from under \$1,000 to about \$9,000.

These systems often work while users sleep, and some store data measured in gigabytes — 2G bytes is about one million typewritten pages — on tape cassettes no bigger than the ones you slide into your car stereo.

Hanon uses the VAST Device backup system from Emerald Systems. VAST's data transfer rate is 1.5M byte/sec. in burst mode and 250K byte/sec. in continuous mode. It also has an internal 256K-byte speed-matching buffer and provides from 250M to 2.2G bytes of storage.

"All you do is log on and then go home," he says. The system lets Hanon

choose to back up daily or monthly as well as a specific day of the week. The system kicks in at a preset time at night and goes to work. An added bonus is the system's unattended operation, which means no lost time during work hours while the data is backed up, he says.

The payoff

The payoff for this diligence came when a 285M-byte hard drive crashed recently. Hanon's department merely waited for delivery of a new drive before restoring the backed-up data in a matter of hours.

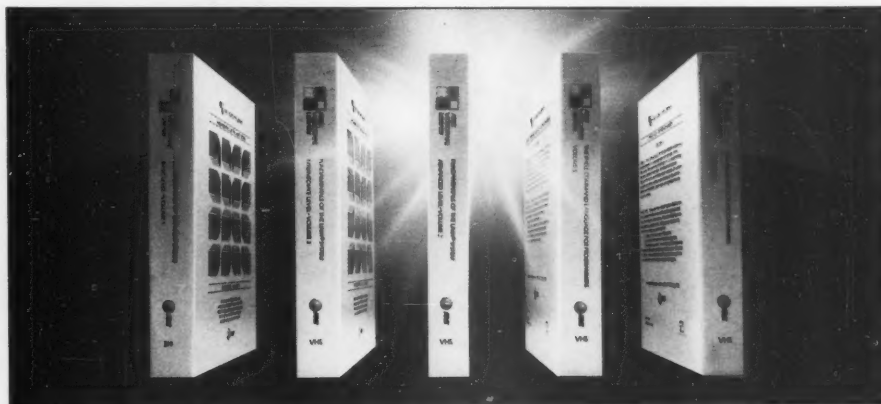
Another VAST user is Mark Hofius, a senior computer systems analyst at Allen-Bradley Co. in Ann Arbor, Mich. His division has 180 PCs and two servers hooked together on a Novell LAN.

When a 175M-byte file server crashed at about 3 p.m. several months ago, Hofius tapped into the division's VAST system and had data restored by 10 p.m. "If I wasn't backing up with the VAST, I'd have had a major problem," he says.

In the case of Columbus, Ohio's, branch of the U.S. Postal Service, the need for LAN backup was cemented by numerous disk crashes. Bob Girardi, a data collection technician, said, "We had been considering the [backup] option for some time, but that first disk failure was the [convincer]." The Mayntstream 60 enabled him to restore data after the second crash in minutes rather than hours.

Gurley is a Wellesley, Mass.-based free-lance writer specializing in high technology.

First we created the UNIX® System. Then we created the most inexpensive way to learn it.



The AT&T Videotape Library. Now, we've added three new courses - all at a surprisingly low price.

Only one company offers superior UNIX System training for far less than you'd expect to pay. The company that *created* the system. AT&T.

It's the AT&T Videotape Library. A series of tapes that lets you study the UNIX System at your own pace. In your own office. And remains an invaluable reference tool for the entire staff.

With full color, high resolution graphics. Video blackboards. And a comprehensive workbook.

Choose from UNIX System fundamental training in Basic, Intermediate, and Advanced. Plus, Shell Programming and C Language for

programmers. And *now*, UNIX System Security, System Administration, and Database Management Using INFORMIX-SQL®.

And only the AT&T Videotape Library has a telephone support line—giving you direct

access to expert AT&T instructors.

The AT&T Videotape Library. Call now for more information.

AT&T COMPUTER TRAINING.

Come right to the source.

1 800 247-1212, ext. 201.

Or send in the coupon below.

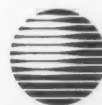
Registrar, AT&T Training, P.O. Box 45038, Jacksonville, FL 32232-9974

YES! I'd like to know more about AT&T's inexpensive way to learn the UNIX® System. Please send information about the AT&T Videotape Library.



Name (Please print) _____
Title _____ Phone () _____
Company _____
Address _____
City _____ State _____ Zip _____

CW101239
© 1989 AT&T



AT&T
The right choice.

UNIX is a registered trademark of AT&T.
INFORMIX-SQL is a registered trademark of INFORMIX Software, Inc.

How the powers at Rolls-Royce Motor Cars found the power
to drive manufacturing into the future.



Rolls-Royce is a trademark of Callinet Software, Inc.

Quality is the power behind the Rolls-Royce name. And the driving force that makes Rolls-Royce one of the world's most demanding customers.

On tradition and attention to detail:

"Meticulous craftsmanship has made our marque a world symbol for quality. In today's competitive manufacturing environment, it is a position we must maintain. It is our past and our future."—Peter Ward

On modernization and CMS:

"Information systems must work up to our standards, within our time-proven manufacturing methods. The Cullinet Manufacturing System helps us do that by providing the information we need to assemble, test and distribute our hand-built cars."—Geoff Moreton

On CMS and the future: "There is an unparalleled degree of integration, both across functions and between hardware platforms. Combined with the flexibility the Cullinet Manufacturing System derives from IDMS/R, Cullinet's relational DBMS, we can continue to assure our customers of the highest quality—even in a world marketplace that's growing more complex every day."—Peter Hill

In today's more demanding manufacturing environment, you'll gain more power over the productivity of your business with CMS. An MRP II application based on IDMS/R that gives you the efficiency and flexibility you need to build on. And on. And on.

Just ask the powers at Rolls-Royce Motor Cars. Or call, toll-free, 1-800-551-4555. Cullinet Software, Inc., Marketing Services, 400 Blue Hill Drive, Westwood, MA 02090-2198.

Cullinet®
The power to build on.

Peter Hill, Director, Personnel and Systems

Peter Ward, Chief Executive

Geoff Moreton, MRP II Project Leader

Infotron adds packets, joins T1 integrators Timeplex, NET

BY ELISABETH HORWITT
CW STAFF

CHERRY HILL, N.J. — Infotron Systems Corp. recently joined the bandwagon of T1 multiplexer vendors that are integrating packet-switching technology into their equipment.

The ability to send packet-switched data over T1 circuits is a high priority for T1 vendors and their users, according to Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consulting firm.

"Packetizing makes more efficient use of T1 channels, allowing you to use less

has entered a joint development agreement with Netrix Corp. to integrate Netrix's packet-switching technology with Infotron's T1 multiplexers.

Infotron will initially provide its own version of Netrix's CCITT standard-based X.25 products as part of its product line in March. By early next year, Infotron multiplexers should be able to carry data from Netrix packet switches and packet assembler-disassemblers, according to Infotron Vice-President of Engineering

Stig Pierson. Co-developed Integrated Services Digital Network products should also appear around that time, he added. In addition, the two firms plan to integrate their network management systems, according to Pierson.

Netrix, a Herndon, Va.-based vendor that sells primarily to systems integrators, already offers a product that allows packet-switched and circuit-switched transmissions to be multiplexed over a 64K bit/sec. line, a company spokesman said. While the company does not yet provide support of 1.5M bit/sec. T1 rates on its own, the spokesman hinted that an announcement is forthcoming — probably at the Communication Networks '89 conference in early February, one industry source predicted.

Bridges

CONTINUED FROM PAGE 55

ring backbone running on coaxial cable. The latter connection can span up to 450 feet without repeaters, Artel said.

Proprietary, high-speed LAN backbones such as Artel's are more suited to handling communications among multiple LANs than products based on current networking standards, Redman said. However, the real breakthrough for the market will be high-speed LAN-to-LAN connections based on the Fiber Distributed Data Interface standard, he added.

Artel is also expected to announce an enhancement that is said to allow its Fiberway family to "carry multiple T1

"PACKETIZING makes more efficient use of T1 channels, allowing you to use less bandwidth for data and more bandwidth for voice."

FRANK DZUBECK
COMMUNICATIONS NETWORK
ARCHITECTS

bandwidth for data and provide more bandwidth for voice, which is circuit-switched," he said.

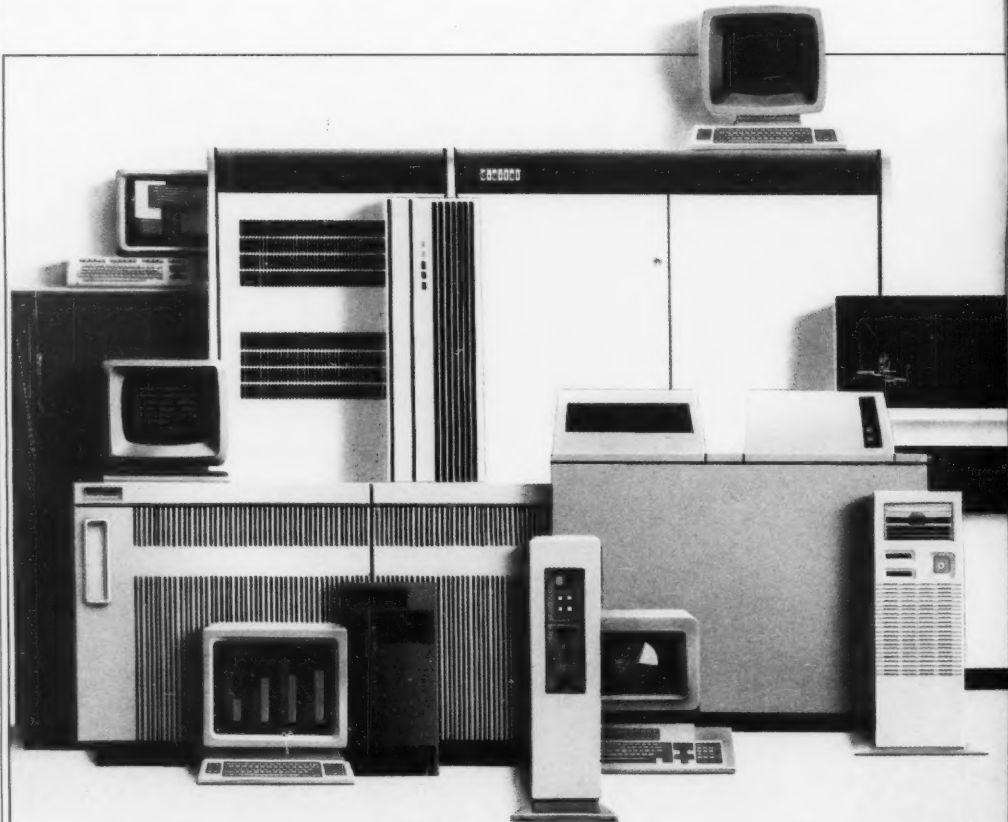
Two T1 market leaders, Unisys Corp. subsidiary Timeplex, Inc. and Network Equipment Technologies, Inc. (NET), are already providing such capabilities by integrating their switches with packet-switching equipment from their respective subsidiaries.

Last January, NET and its subsidiary Comdesign, Inc. jointly announced the SPX Network Processor, which uses packet technology to handle multiple 9.6K bit/sec. transmission rates over the same 9.6K bit/sec. line, according to Comdesign Product Manager David Hofstatter. Linked to NET's IDNX T1 switch, the multiplexer significantly boosts the utilization of each slice of the T1 circuit-switched path, he added. NET also provides a product to manage both SPX and IDNX devices.

Timeplex subsidiary Cygnus Computer Corp., acquired 2½ years ago, provides "the basis for our packet-switching line, Timepac," said Timeplex spokesman Gregory Langford. Cygnus packet switches and packet assembler-disassemblers can now send data over a 64K bit/sec. channel handled by Timeplex's Link T1 switch family, he added. Further integration of Timeplex's circuit- and packet-switching technologies is in the works, the firm said in a recent statement of direction. Users will be able to manage both types of products with the next version of Timeplex's network management system, Timeview, Langford said.

On the other hand, another T1-switch market leader, Digital Communications Associates, Inc. (DCA), has no current plans to integrate packet and T1 switches, even though the company offers both types of products, a DCA spokeswoman said.

Infotron, based here, announced that it



We have ways of

© 1988 Hewlett-Packard TSI5901

We call it HP AdvanceNet. An open, highly efficient networking solution for multi-vendor environments.

"A few years ago, Hewlett-Packard made what must have been a difficult decision: It bit the bullet, gave up its proprietary networking products, and embraced industry standards long before most vendors even knew what commitment to industry standards implied. We have nothing but admiration for HP's commitment to OSI and multi-vendor interconnectivity."

—The Yankee Group

This "connectability" provides you with one very important benefit. Vendor independence. The ability to connect to equipment you presently own, as well as to equipment you'll be buying in the future.

In addition to standard networking capabilities, HP AdvanceNet offers many functions not available from IBM and DEC. Functions such as StarLAN 1 and 10, a cost effective link for small companies

signals concurrently with Ethernet traffic," the company said. As a result, Fiberway can be used as a metropolitan-area network supporting both voice/data T1 links and LAN interconnections, Artel said. The product is scheduled for release this spring.

- Advanced Computer Communications Corp. (ACC) in Santa Barbara, Calif., is expected to introduce ACS 4100, a bridge said to connect two or more Ethernet LANs over a long-distance link. The 4100 reportedly can perform either as a protocol-independent bridge or as a router that provides more sophisticated connections between devices that use the same networking protocols.

- Computer Network Technology Corp. in New Hope, Minn., will be announcing

expanded support for its Lanlord 8000 Series of Inter Processor Networking Gateway products, which are said to provide channel-based connections between mainframes and various devices on Ethernet LANs via Transmission Control Protocol/Internet Protocol.

The new Lanlord Model 8100 is said to support IBM MVS and VM hosts, while the Model 8200 is said to support Digital Equipment Corp. Unibus or BI bus systems.

- Crosscomm Corp. in Marlboro, Mass., is expected to announce three token-ring LAN bridges. The first will connect multiple LANs, the second will connect a LAN to a 1.5M bit/sec. T1 long-distance link and the third will connect a LAN to a 56K bit/sec. long-distance connection.

Keefe

CONTINUED FROM PAGE 55

tic- and glass-fiber network last week (see related story page 55), claims to have overcome some of the drawbacks to plastic. It also maintains that plastic fiber is more secure and comparable in price to copper twisted-pair cable.

Even so, "It won't be really crucial to bring fiber to the desk top until the advent of super high-powered workstations," predicts Richard Cerny, president of Trellis Communications, a Salem, N.H.-based systems integrator that specializes in fiber-optics technology.

With numerous campus installations under his belt, Cerny says he has seldom

encountered a need to bring fiber to the desk top. "And if we did, we'd bring glass to the desk, so that it could hook into the glass backbone," he says.

This brings up another issue worth considering. Two glass-fiber cables of different diameters can be tied together more easily than can be done with plastic to glass, claims Bill Redman, an analyst at the Gartner Group, a Stamford, Conn.-based market research firm.

Netronix would dispute this point, given that it is suggesting that users who want to travel greater distances than are possible over plastic fiber, hook into glass-fiber cable. The supplier also claims that plastic fiber's bigger core, through which it transports light, is less susceptible to interference from sources such as dust particles.

Plastic fiber's ace in the hole seems to be the promise of lower costs and simple installation. But it is hard to compare the cost of a desktop configuration rigged up with plastic fiber — such as Netronix seems to be targeting — with a campus network wired with glass.

Redman and Cerny also take issue with the premise that plastic is easier to deal with than glass. Both fibers are fair-

PLASTIC FIBER'S ace in the hole seems to be the promise of lower costs and simple installation.

ly flexible and both degrade as they age. Plastic may be less sensitive to rough handling than glass, but it is also more likely to discolor, affecting light transmission and bandwidth. And it may be more prone to kinking, which would scatter light signals.

"If plastic was cheaper and more reliable, then you'd see AT&T, Siercor and Corning Glass pulling it," adds a skeptical Redman. These vendors have invested heavily in glass-fiber optics. Not surprisingly, they have put considerable weight behind the emerging FDDI standard, which requires glass fiber.

Another factor cementing glass fiber's popularity is IBM's recent decision to purchase 25% of PCO, an optoelectronics subsidiary of Corning Glass. IBM is committed to FDDI and has promised users an FDDI product by year end.

"IBM has an absolute need for this technology. You just can't build mainframe complexes without fiber anymore," says consultant Frank Dzubeck, president of Communications Network Architects.

What this all boils down to, Trellis' Cerny says, is that a decision to go with plastic fiber is a nonstandard decision. This may be perfectly acceptable to a lot of users, especially if plastic fiber can be cleanly linked to other network media.

As always, users need to make decisions based on factors such as their future directions (FDDI), how well suppliers are able to overcome plastic's shortcomings — for example, shorter distances and smaller bandwidth — and how entrenched glass or twisted-pair cable is in their systems.

Plastic is certainly worth taking a look at. Just be on the lookout for any hidden or intangible costs.

Keefe is a *Computerworld* senior editor, networking.



making them talk.

or departments using PCs. And OpenView, a network management system which easily incorporates multiple vendors' networking products into a Windowing function.

All of which puts HP in the right position to help make your company more competitive. Not only with the links to make your entire computer system, from mainframes to desktop PCs function as one, but with the support and

service to keep it functioning.

In fact, HP will shoulder responsibility for planning, operating and troubleshooting your entire multi-vendor network, even the components which aren't ours.

For more information on HP AdvanceNet, call 1-800-752-0900, Ext. 282F.



NEW PRODUCTS

Local-area networking hardware

Crosscomm Corp. has announced a fiber-optic adapter card designed to add fiber-optic network capability to any IBM Personal Computer XT, AT or compatible system.

The FA1 provides both single- and dual-fiber capability that supports 62.5 to 100mm cable as well as a connector for thin Ethernet. The card uses a half-length PC bus card and is said to be transparent to existing network software. The FA1 costs \$995.

Crosscomm, P.O. Box 699, Marlboro, Mass. 01752. 508-481-4060.

Cabletron Systems, Inc. has announced a multiport twisted-pair repeater designed to increase flexibility when connecting twisted-pair and coaxial cable Ethernet local-area network segments.

The Model MR9000TPT is intended for small work groups running Ethernet over twisted-pair requiring connection to existing coaxial or fiber LANs and backbone networks, the vendor said.

Up to eight twisted-pair segments can be connected via RJ-45 ports, and the product reportedly includes full IEEE 802.3 repeater functions.

The MR9000TPT has a price tag of \$2,895.

Cabletron, P.O. Box 6257, Rochester, N.H. 03867. 603-332-9400.

Local-area networking software

Data Race, Inc. has added networking features to its PC-Race Fax software that lets supported users originate, send, view or print received Group III facsimile messages.

The enhancement reportedly converts any IBM Personal Computer or Personal System/2 that is equipped with a Data-race Mastermodem into a fax server for any member of a DOS local-area network.

The upgrade is free to all registered users, and the upgraded Mastermodem PC-Race Fax package is available for \$295.

Data Race, Suite 108, 12758 Cimarron Path, San Antonio, Texas 78249. 512-692-3909.

Tymnet gets Unix management

McDonnell Douglas Network Systems Co. in San Jose has unveiled an end-to-end Unix-based network management system for users of the company's Tymnet networks.

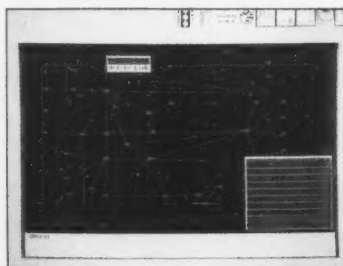
According to the vendor, the system was designed to provide customers with a framework for future integration needs.

A recent report by Framingham, Mass.-based International Data Corp. noted that 50% of network users have as many as three different network management systems installed, while another 32% use as many as six — each designed to support only one vendor's line of equipment.

The McDonnell Douglas product will operate in a variety of vendor environments, the company claims, and will accommodate the integration of other network management systems such as Netview, IBM's host-based offering. The product is built around a Sun Microsystems, Inc. server and access workstations and was designed to optimize resource usage while minimizing overhead.

The system reportedly handles net-

work access and routing; data collection; monitoring and control; performance and utilization; and configuration management. It also



McDonnell Douglas addresses integration

provides security and automated trouble ticket reporting.

The system is scheduled for delivery late this year, and pricing will be between 10% and 20% of overall network costs, depending on the client's individual requirements and the existing hardware configuration.

McDonnell Douglas Network Systems, 2560 N. First St., San Jose, Calif. 95131. 408-922-0250.

STILL IN THE DARK ABOUT SOFTWARE TESTING COVERAGE?

YOU'RE NOT ALONE.

You wouldn't knowingly put an untested program into production. Yet untested logic goes into production every day. Why does this happen? Because effective test coverage analysis can't be accomplished manually.

But now you can shed some serious light on the thoroughness of your COBOL testing with Analyzer. The automated MVS test coverage monitoring tool.

Analyzer lets you keep track of what program logic has and hasn't been tested. So with Analyzer evaluating the thoroughness of your test, you'll be more confident that your software will be successful in production.

Analyzer. The light at the end of the testing tunnel.

For more information or a free evaluation of our automated MVS test coverage monitoring tool, call us at 1-203-277-9595.

TRAVTECH Inc.

One of The Travelers Companies, One Tower Square,
Hartford, Connecticut 06183

Analyzer is a product of Aldon Computer Group and is marketed and supported by TRAVTECH, Inc.

Torus Systems, Inc. has announced a Network Integration Option for its Tapestry II LAN Manager product line.

According to the vendor, the option will permit an unprecedented degree of integration between Novell, Inc. Network servers and Microsoft Corp. OS/2 LAN Manager servers on the same network.

The Network Integration Option is offered as an add-on to Tapestry II LAN Manager and is priced at \$295.

Torus, 240 B Twin Dolphin Drive, Redwood City, Calif. 94065. 415-594-9336.

A software utility said to be capable of defeating security on all versions of Novell, Inc.'s Advanced Netware has been released by Network Business Systems.

The Netcrack program requires access to the network file server and a backup copy of NET\$OS.EXE. After using the product, the network will have only default users and default security but no passwords. Netcrack costs \$99.

Network Business Systems, Suite 15601, 1300 Woodhollow Road, Houston, Texas 77057. 713-781-9268.

Links

Software that connects independent IBM Systems Network Architecture networks using the IBM 3737 Remote Channel-to-Channel Unit has been announced by NTX Communications Corp.

Cross Network Facility/Channel-to-Channel is said to be a VTAM application running under IBM MVS/XA or MVS/370. It was designed to provide a transparent interface between several VTAM applications, including MVS/Bulk Data Transfer, JES2/NJE, CICS and IMS.

Scheduled for delivery this quarter, the product is priced at \$36,000.

NTX, 508 Tasman Drive, Sunnyvale, Calif. 94089. 408-747-1444.

Simware, Inc. has released Version 2.0 of Mac3270, the company's connectivity product for Apple Computer, Inc. Macintoshes and IBM mainframes.

Version 2.0 reportedly supports all popular 3270 emulation methods and provides error-free two-way Macintosh-to-mainframe file transfer capability across several communications paths.

An asynchronous version is available for \$250; the Master version of Mac3270 Version 2.0 is priced at \$325.

Simware, 20 Colonnade Road, Ottawa, Ont., Canada. K2E 7M6. 613-727-1779.

Forest Computer has unveiled the AS/400 Adapter, which is designed to enable Digital Equipment Corp. Decnet-based terminals to access IBM Application System/400s as full-screen IBM 3270 devices, and AS/400-based terminals to access Decnet as full-screen DEC VT220 units.

Available now, the processor and AS/400 adapter cost from \$35,000.

Forest Computer, 1749 Hamilton Road, Okemos, Mich. 517-349-4700.

Electronic mail

Wang Laboratories, Inc. has introduced Wang Office/Voice Mail, a voice messaging system that runs on Wang's VS computers.

The product was designed to be integrated with VS Office Electronic Mail to form a single communications medium for sharing data, text, image and voice, the vendor said. The system consists of three components: Automated Attendant, Message Center and Voice Mail.

Wang Office/Voice Mail is priced at \$2,800 for a license. VS Office software is licensed separately and is priced from \$5,000 to \$18,000.

Wang, One Industrial Ave., Lowell, Mass. 01851. 508-459-5000.

EXECUTIVE REPORT

THE RESTRUCTURING OF MIS

Data centers: Dropping walls and building new identities

BY PATRICIA CINELLI

Data centers aren't what they used to be. Major alterations are taking place in these units as they begin to adapt to new realities and new expectations.

At the beginning of this decade, the idea of isolated preserves of computing power made sense, says Vin Tomasulo, vice-president of the Chase Financial Services Data Center at Chase Manhattan Bank N.A. But since then, a lot has changed.

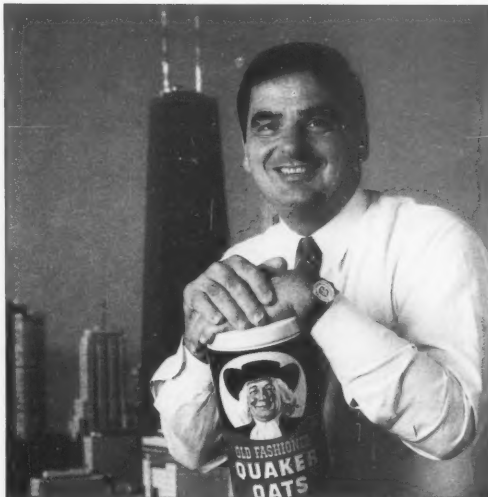
At one time, hardware was unstable and had to be protected, Tomasulo explains. Now it is robust and powerful and designed for exploitation. Previously, the goal was to develop systems. Now and in the future, the emphasis will be to develop systems rapidly. Work used to be done in batch mode. Now, the predominant orientation is on-line. Fragmented telecommunications has started to coalesce, creating the outline of a unified information environment that must not only be managed but also leveraged for organizational benefit.

Revisions ahead

The net effect of all these changes, Tomasulo and other information systems executives agree, has been a rewriting of both job descriptions and data center procedures.

In the past, the data center operated at the survival level, with all things being done to maintain its mere existence, Tomasulo states. These days, data centers are geared toward servicing and supporting the user or the business customer.

"You have a new set of objectives when you don't have to worry about computers breaking down," he says. "Now, the focus of the data center is delivering information to customers — what they want and when they want it, because today's businesses look to their data centers as the source of a competitive



Quaker Oats' Brzezinski heralds the data center's evolution.

edge," Tomasulo adds.

That change in expectations, says Ron Brzezinski, vice-president of information systems at Quaker Oats Co. in Chicago, has transformed what used to be a backroom operation into "the hub of the organization."

The proliferation of technology outside the computer room at Quaker Oats has not diminished the work of the computer center, Brzezinski says. On the contrary, it has added new layers of responsibility. "We have a fiber-optic backbone network strung throughout our building," he says. "We have LANs and numerous interconnected desktop computers. This web of technology has to be managed just like the mainframe."

Furthermore, management of the expanding information systems web is not simply a matter of mechanics. Data center

personnel are not just being asked to understand, connect, maintain, create and secure new kinds of systems; they must also adjust to entirely new quantities and types of demands.

Once restricted and purely technical areas, data centers are now open to business units in multiple ways. "The same manager who used to control the 'off-limits' data center now manages the company's technological network," Brzezinski says. "He now has continual contact with business needs and clients' applications in his day-to-day operations."

Tough questions

And, he adds, because technology has become a familiar and integral aid to decision making, the requests and questions received are not as easy to solve as they once were.

Once a typical user question fielded by the Quaker Oats data center's Help desk would have been something like "Can my report be out on time?" These days, staff are hearing questions such as, "I can't access my information. What's wrong?" Brzezinski says the Help desk has effectively become "the first line of problem resolution for the entire company."

This heightened role is reflected in both a name change — Quaker Oats has rechristened its Help desk "the command center" — and in staffing level. "Two years ago," Brzezinski says, "we had one person on the Help desk. Today, we have six."

Not only on Help desks, but throughout the entire data center structure, a reorientation is taking place, from technical administration to customer service.

At Chase Manhattan, for example, Tomasulo says that the articulated goals for the organization's 110 data centers worldwide are dissemination of information to the business departments and close collaboration with business department users, or "customers."

There are a number of ways that those goals translate into actions. Applications are being designed to meet customer requirements, Tomasulo says, but that is only the beginning. Job functions within the data centers are also being altered to enhance user satisfaction.

One instance of this, he says, is a new functional concentration on incident management, which goes beyond simply identifying and treating system problems to locate and rectify their root causes.

Effecting this kind of change in the orientation of a data center is not easy. "It takes a while," Tomasulo observes, "to master the dynamics." And trying to do so without finding some way to lessen the already existing technical load is about as tricky as trying to execute a U-turn in a speeding vehicle.

Even without the added responsibilities of network maintenance and substantive user support, operations staff have their

INSIDE

Automation redefines management

Page 67

New options for existing personnel

Page 74

Cinelli is a free-lance writer based in Washington, D.C.

Data centers

FROM PREVIOUS PAGE

hands full handling increased message volume and keeping up system service levels in an on-line environment.

Selling like hotcakes

That is why software products designed to automate a variety of chores performed within the data center have recently become a high priority on many managers' shopping lists. Tape library systems, job scheduling systems and automated documentation systems, which have been available for a number of years, are selling better than ever.

And newer categories of automated operations products, such as performance monitors, problem change management systems, chargeback systems, report distribution systems, automated balancing systems and console management systems, are finding an eager market.

"Recently we've seen a big push toward automated console management systems, which alleviate the need for operator or manual intervention," says Neal Ater, vice-president of research and development at Goal Systems International, Inc., an international company that makes software for the IBM mainframe.

The most basic level of console automation, according to Ater, is message-reduction software that "sits between the console and the message and throws away messages you don't need to see," he says. The next phase is a software package developed by the company that can automate standard responses or repetitive actions.

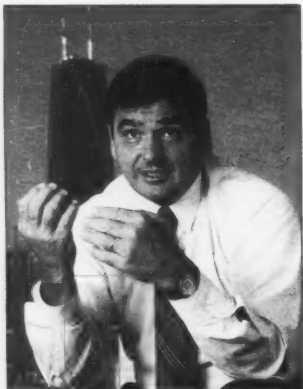
Just the first level represents a major assist for operators, according to Tomasulo. At one time, an operator's main task was to defend himself against the onslaught of calls, he says. Using products that screen spurious messages allows him to concentrate on more substantial chores.

"The environment became so complex that we had to have programs that could identify and resolve problems while we were driving down the highway at 60 mph," adds Gary Kirkham, a consultant with Forecasting Planning Associates, headquartered in Dallas.

With partial automation, operations staff are freed from some of the routine chores such as scheduling, tape management or console monitoring and given increased latitude for new responsibilities.

Guardian Life Insurance Co. of America in New York can attest to the efficiencies that a change in emphasis produces. Thanks in large part to its adoption of several automation products, the insurance company found it could merge its New York data center with its Bethlehem, Pa., operation and also absorb additional work without hiring additional people. The merger occurred just before Thanksgiving last year.

"Except for a skeleton crew, the New York staff was redistributed and assigned other functions in data processing," says Alex Polohovich, systems programmer.



Brzezinski expounds on the heightened role of an organization's Help desk.

Although Polohovich did not formally plan for the consolidation, he says that the transition was a smooth one, partially because Guardian had begun automating functions within the data center several years ago.

The organization had been gearing up for such a change, he explains, by using automated products such as Computer Associates International, Inc.'s CA7, an automated scheduling package; CA's CA1, an automated tape management package; and IBM cartridge loaders for tapes.

The most recent addition to the mix was Candle Corp.'s AF/Operator, a package that catches all commands issued to the system, takes action, tries to correct errors and contacts operators immediately to prevent backlogs. Using AF/Operator saved the Guardian data center from hiring about seven extra people, he claims.

The real motives

Polohovich stresses, however, that the merging of data centers was not motivated only by budgetary considerations. Cost cutting was definitely a factor, he says, but Guardian was also trying to improve the speed and the quality of service it provided its users. Data center managers must now communicate to their staffs the message that automation and functional changes in

the data center are both necessary and well-intentioned.

In most cases, however, total automation and wholesale layoffs are not the real purpose. Brzezinski, for example, is careful to point out that the moves taken toward data center automation at Quaker Oats are not necessarily a prelude to lights-out status.

The objective, he says, is to expand management responsibilities throughout the organization and to integrate the technology. Even so, he admits this may not be an easy adaptation for either data center staffs or managers. "It's tough because you are taking people who have been isolated [in the organization] and making them a part of the business," Brzezinski says.

But a convincing case can be made that revamping data centers and the automation of some manual functions creates a more rewarding job path for most data center personnel.

Forecasting Planning's Kirkham, for example, predicts that some operators will move into systems programmer positions. "With the boom in micros," he adds, "those not attuned to programming can move into micro maintenance and wire management."

Time on their side

At the Washington, D.C., data center of the American Association of Retired Persons, Center Manager Ed Hopkins says that automation products have definitely changed the jobs of his operators for the better. "Operators have more time to do things like monitor system performance, do capacity planning and work with users, a task that has gradually moved out of the director's realm and into the realm of the operators," he notes.

And, at Perpetual Savings Bank, FSB, in Alexandria, Va., Ross Markley, data center manager, says CA's CA-Scheduler package, which took over all the job scheduling on the bank's IBM 3090, served as a catalyst for job advancement. "Now a scheduler is sent to school," he says, "and we have changed from basically a clerical staff to a more technical one."

One of the benefits of automation is that it allows the bank to grow without adding to the data center staff, Markley says. Since he joined Perpetual about 2½ years ago at a point when the bank was just beginning to install automated products, Markley says the data center work load has increased about 150% to 200%, but the staff has not increased at all.

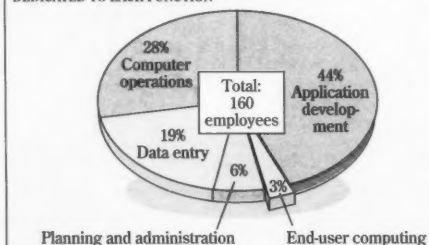
Now, he says, "A bigger portion of our budget is going to automated products, which is more cost-effective than paying for additional staff." The real savings, however, are in not hiring new workers, rather than eliminating existing personnel,

A case of shifting priorities

What follows is a picture of how an insurance company has already altered its MIS staff distribution and how it sees that distribution shaping up 10 years from now. The company, studied by Forecasting Planning Associates, is described as a mature firm with an effective management control system, strong internal controls and moderate growth.

1978 allocation of staff

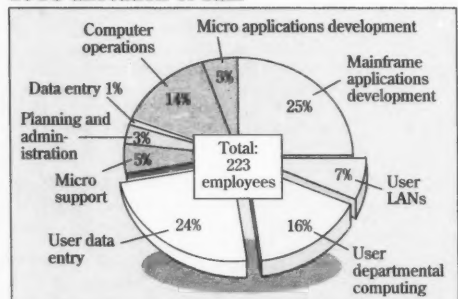
PERCENT OF COMPUTING PERSONNEL DEDICATED TO EACH FUNCTION*



*May not total 100% because of rounding

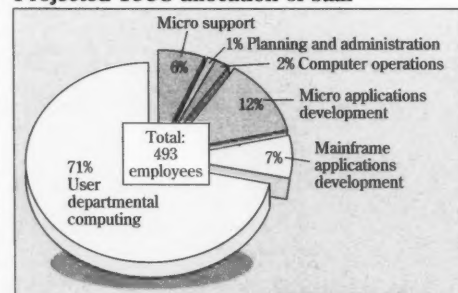
In 1978, most of the staff allocations were applied to applications development, with computer operations taking second place and data entry third. Only a negligible 3% of the staff was allocated to support end-user computing that year.

1988 allocation of staff



By 1988, user-related activities had risen substantially on the staffing allocation agenda, while the percentage of the computer operations staffing was only half of the 1978 allocation level and data entry staffing was down to only 1%.

Projected 1998 allocation of staff



SOURCE: FORECASTING PLANNING ASSOCIATES
CW CHARTS: DOREEN DAHLE

The company is forecasting even greater changes for 1998, ones that will further deemphasize staffing for traditional data center functions for the following reasons:

- Intel Corp. 80486/586 chip technology will dominate the market.
- Computer-aided software engineering will mature.
- Commercial software offerings will continue to improve.
- Automated operations will be tightly integrated with the mainframe operating system.
- Bar coding and optical scanning will eliminate data entry.
- Optical-disk technology will be used for storage.
- Automated network linkage will be in place.

INTERVIEW

Data center managers tackle the automation imperative

Leonard Eckhaus is president of the Association for Computer Operations Management (AFCOM), a group of operations management professionals primarily working in large-scale data centers. AFCOM's mission is to help its members respond to changes in the data processing environment that introduce new management challenges. Eckhaus spoke recently with *Computerworld* Senior Editor Joanne Kelleher about how automation is altering data center operations.

What do you consider the major management challenges facing operations managers right now?

Automation is the single biggest thing coming and will have the most impact of anything going on today. The changes, in terms of operations, are going to be dramatic. End-user computing, where inputting data, printing reports and so on are being passed on to the user, is reducing staff in the operation. Operations managers are going to have to deal with people problems because there will be an elimination of jobs.

Some of that is already happening isn't it?

Yes. Most data centers have either totally eliminated the data entry department or else reduced it to just a few people working on miscellaneous things that come in. It is also evident that there is going to be an elimination of most or all of the computer operators in terms of the traditional work they now do such as mounting tapes, pulling forms from the printer or responding to console messages.

Do you have any sense of where these people are going, how they are being used?

In a lot of cases, the jobs are just disappearing and the people aren't being moved elsewhere. There are other areas in operations that some data entry people can go into. They can function, for in-

stance, as data control clerks. But for the most part, the people are just being let go. Data entry departments are on their way out.

I take it that you think that there are better alternatives.

I think that if automation is going to work, even the people whose jobs are going to be phased out have to somehow be assured that they will be retrained for better jobs in the data center or that they will wind up working in a user department in which they will be viewed as experts.

What do you see as some of the new roles for staff? What kinds of jobs will they be doing?

What is going to come in is an addition of higher level technical analyst positions in which the job will be to monitor system activity and react to conditions that the automated systems bring to their attention.

We'll also see things like performance measurement analysts, systems software analysts and programmer analysts in the operation. Now, these positions obviously already exist in areas outside the operation. But when we get close to unattended operations, these positions will have to be in the operations area.

A little earlier, you mentioned the idea of personnel actually going out into the end-user departments. Do you, in fact, expect that there will be staff attached to the data center or to the operations area who will serve as sort of resident consultants in the business departments?

I'm sure there will be, although what I was referring to before is that end-user departments are going to want to have some people with DP backgrounds working for them. I think we'll see both kinds of arrangements. It is likely that there will be people in the data center who will spend all their time interfacing with the end-user departments, training them,

the future, we will have to watch month by month and be able to react very quickly" to the situation.

Furthermore, Markley adds, "People in the network side of data centers need to become more refined in their public relations ability and in their knowledge of how PCs interact with the mainframe. The big focus at Perpetual and eventually everywhere will be on security of data."

Data center managers are also due for a change, according to Quaker Oats' Brzezinski. Their role, he says, is changing to something that might be more accurately described as a technology center manager. And the requirements for that type of position are quite different. It is a job that will require both strong technology awareness and a business applications perspective.

"Before, we were satisfied with someone who could enforce schedules and manage vendors, but in the future, that will not be good enough," he says. •

helping to get service on their equipment and so forth. But I also think that some of the [displaced] people will end up working in the user departments.

Do you have a sense of the likely time frame for widespread automation?

Well, people talk about automation and they talk about unattended or lights-out operations. There is really a big difference. Today, unattended is still a concept. Almost nobody is truly running unattended. Automation, on the other hand,



AFCOM's Eckhaus

is something that is here. Virtually all large-scale data centers have some degree of automation; they have a tape library system or a scheduling system, or they have two or three or four or five different software systems.

Are operations managers taking charge of automation efforts, or are they letting the vendors set the pace and the direction?

Up until now, it has been more the vendors taking the lead. But now, operations managers are realizing that this is the wave of the future, and they must take control of the situation and be involved in actually coming up with a plan to get automated.

What caused this change of heart?

Operations managers are realizing that they need to be automated just to keep up with today's computer equipment. For example, with the internal speed of today's computers, the number of messages that are generated on a console can become impossible for an operator to handle. So console management that will answer standard console messages becomes almost a necessity if you want to keep the system running efficiently.

Are there any other areas in which the pressures are becoming more than can be humanly handled?

Maybe not more than can be humanly handled, but you have to remember that every time there is a human handling, it takes time. You've got a CPU sitting there and if it waits one second, that second on some CPUs could have been used to perform several million additions. Where things are automated, you gain all

Continued on next page

Data centers

FROM PREVIOUS PAGE

he says. There is also a portion of the budget set aside for retraining and continuing education of data center staff.

Markley says he fully expects that the data centers he and other managers will be overseeing in a few years will be at least qualitatively different from what has existed.

Adapting to survive

In order for data centers to survive, he says, they will have to be automated and well controlled in functions such as scheduling, report distribution, performance and capacity planning. They will also have to process information quickly and accurately.

"In the past, we could see the need for an upgrading of a CPU coming years in advance," Markley reports. "Now and in

**See
COMPUTERWORLD's
January 30 issue
for the
Special Report on
Communications
Innovators.**

**The Special Report
will also be distributed at
Communication Networks '89.**

Interview

FROM PREVIOUS PAGE

of that time back.

Is there any top-down pressure being applied by, say, the head of MIS?

It may come from the head of MIS but certainly no higher. In most cases, it goes the other way. The operations manager who wants to do more automating is having to justify it and go in and say, "I'm going to be able to save dollars in terms of head count" or "I'm going to be able to service the user much better."

The way that this is often dis-

cussed is as returning management to the end user through automation. The question is, if you return management to the end user, exactly what does that leave in terms of data center or operations duties?

What we are really talking about is returning some of the control to end users. There are some things they are doing now that used to be done in the computer center, like inputting data, getting output directly back. In some installations, users can, within certain limits, even schedule their own work in terms of when it is going to run. They're not doing the job of running the systems or of maintaining the hardware, but they are going to have more control over their own work.

Is increased automation the only major change affecting data center operations? How about downsizing?

Over the last few years, we've begun to see downsizing in some medium-size data centers as they go from mainframes to minis. It is still not a major thing, but it is happening in small numbers. When you go from large mainframes to large mini systems, some of the traditional operations stuff is no longer necessary. Maintenance is different. The kinds of operating systems you are using are different. It changes the name of the game for operations.

Is there any possibility that, to a certain extent, the willingness to

entertain the idea of automating operations results from seeing it as an alternative to wholesale downsizing?

I'm not sure. I don't really think so. Downsizing is a term that means different things to different people. You could replace one large mainframe computer system with 10 minicomputer systems. In that case, would you really be downsizing or are you creating more problems and more areas to get involved in?

How about downsizing in the sense of certain functions moving out into the departments on either departmental minis or local-area networks? What impact is that having?

One of the things that happens is that some of the budgets for hardware wind up going into the end-user departments. Also, the end users are getting more sophisticated, so they want more input on what kind of hardware is going to be purchased for their use. So the data center becomes much more of a service area, and the job becomes more one of servicing requests than of dictating what can or can't be done.

This may be the way it should always have been, but it is only recently, I think, that people in data processing have been realizing that they really are a service adjunct and not the company's main business.

Do you see any of these changes affecting the data center's relation to other parts of the MIS organization?

Yes. One way is in terms of status. In the past, operations managers have been much more managers of people and large budgets than they have been managers of technology. It is strange because it is a reversal of the way the rest of the world operates, but, in a technical field, that really becomes a hindrance in terms of professional recognition.

In a technical area, when you look at managers in terms of status, the more technical the people in the area, the more recognition [the area] is given. Through automation and the elimination of the lower level jobs and the growth of the higher technical-level jobs, these managers are starting to be looked at as managing technology.

So there are some real benefits in automation for the operations manager?

Oh, I think there are a lot of benefits. They're not going to be fighting wars all the time trying to explain why things went wrong. There won't be as many day-to-day problems coming up in the operation in terms of production.

What should the wise operations manager be doing now to guide the automation process and make sure that it is on track?

I think the wise operations manager is looking at his data center as it stands and the applications that are being run today as well as where that data center is going — what is going to be happening to the work load, what new applications are coming up — and developing a plan to get automation installed.

There really has to be a plan for automation because, in many cases, operations managers are going to have to justify the up-front costs that are involved. •

PROVEN PERFORMANCE. PROVEN RELIABILITY. PROVEN TECHNOLOGY.

PROVEN POSITIVELY.



Award-winning Design

It's no surprise that System Industries SI93 C-Series disk drive was the overwhelming choice of thousands of *Digital Review* readers who compared the quality, performance and reliability of half a dozen products in the disk storage category.

100% DSA Compatible

Compare it for yourself and you'll see that our award-winning SI93C is smaller. More powerful. More reliable. And much less expensive than comparable capacity drives.

This high speed Winchester drive offers 50,000 hours MTBF, 15ms average seek time and 23ms average access time. And it's 100% compatible with all DEC DSA controllers.

Special Offer

When you buy a subsystem with four SI93C disk drives by March 15, you'll get a priority delivery position on any of our HSC-compatible tape products, plus a 10% discount on the tape. Delivery on the HSC tape products must be taken by July 22, 1989.

For more information on System Industries SI93C and our complete line of integrated storage subsystems, write or call us toll free for the number of the System Industries Sales Office nearest you, and remember to ask your System Industries sales representative about our other disk and tape special offers.

1-800-333-2220

System Industries
560 Cottonwood Drive
Milpitas, CA 95035



Make Your Winning Decision Today!

- ☐ Please send me additional information about AutoMate/MVS.
- ☐ We want to try AutoMate/MVS free for 30 days.

Trail License Agreement for MVS.

Send us a 30 day free trial of the above checked software. We agree to the following terms and conditions concerning software.

1. Software is a proprietary computer software system owned by Duquesne Systems Inc. (DSI)
2. We agree not to copy, sell, or give away the software distribution materials, and we will exercise precautions to preserve proprietary aspects of software.
3. DSI will not be liable for any direct or indirect damages relating to the use of software.
4. If we decide not to purchase software at the end of the trial, we will discontinue using software, will return the software distribution materials to DSI, and will delete all copies of software from our computer libraries.

Signed by _____

(To be signed if trial is requested)

Date _____

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

Telephone _____

Operating System _____

No. of CPUs _____



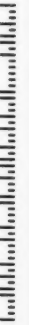
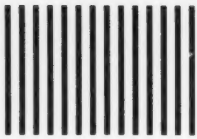
BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 13340 PITTSBURGH, PA

POSTAGE WILL BE PAID BY ADDRESSEE

Duquesne Systems Inc.
Two Allegheny Center
Pittsburgh, PA 15212

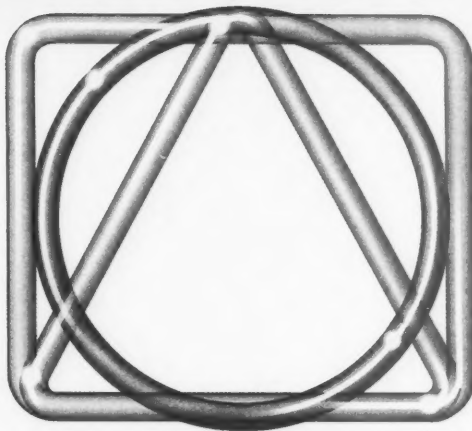
AO-MVS97-1
CM-1/23/89

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



OPEN SOFTWARE ARCHITECTURE

YOU NEED IT. AUTOMATE/MVS™ HAS IT.



Operators deal with multiple message streams. From multiple vendors. So, shouldn't your automated operations product be like your operator? AutoMate/MVS is.

Many software vendors stress integration to other products they sell. Their automated console products interface with their performance monitors. Or their job schedulers. Or their databases. Sure, AutoMate/MVS also interfaces with other Duquesne Systems' products such as Multi-image Manager, SMR, TPX, DASDMON and NetSpy™.

But isn't there more? You bet. With its new Open Software Architecture feature, AutoMate/MVS grabs information from multiple sources. Such as CA-7™. And Candle's Omegamon™. And IBM products such as NetView™, RMF and IMS.

Duquesne Systems' customers worldwide have discovered that AutoMate/MVS is powerful, easy to use, and complies with SAA standards. And they have the support of a company that has been developing lead-

ing operations productivity software for nearly 20 years. And rated #1 in technical support by close to 100% of our customers.

AutoMate/MVS is the tool for all the right reasons, now, and as your automated operations environment grows. It's a winning decision. Make it today. Call **800 323-2600** and ask for your Duquesne Systems account representative (in Pennsylvania, call **412 323-2600**).

CA-7 is a trademark of Computer Associates, Garden City, NY.
Omegamon is a trademark of Candle Corporation, Los Angeles, CA.
NetView is a trademark of IBM, Armonk, NY.



**DUQUESNE
SYSTEMS**

Two Allegheny Center
Pittsburgh, PA 15212

The writing on the data centers' walls

*What they are doing today,
where they will be tomorrow*

It is widely acknowledged that data centers are entering a period of considerable change. In the interest of getting a better reading on the force and direction of this phenomenon, *Computerworld* spoke with a number of information systems managers working at or near the epicenter about changes that have already taken place in their organizations' data centers and what further developments are expected.



Robert Martinko
Manager, information processing
East Ohio Gas Co.

Here and now: "In our own corporate center, we're going to unmanned rooms, where your CPUs, your controllers, your jazzy devices are being isolated away from the mainstream of activity."

Around the corner: "The next move is PCs totally being capable of interfacing with the host. Some of them are becoming so powerful, you'd think they're little hosts in their own right, right now."

"In some cases, you're probably going to see some shrinkage in staffing of corporate data centers because of the database structures that are becoming more and

more prevalent. Data is going to be much more readily accessible from remote areas, even by way of PCs."



Ronald Kovich
Second vice-president,
corporate technology services
Unum Life Insurance Co.

Here and now: "There will always be large, central data centers. I don't think there's going to be any major revolutions in the next five years. There will be larger and faster mainframes and more sophisticated software. How they're managed will be important and the technical expertise to manage them is going to be critical. I think operations will evolve into a more challenging role than it is today."

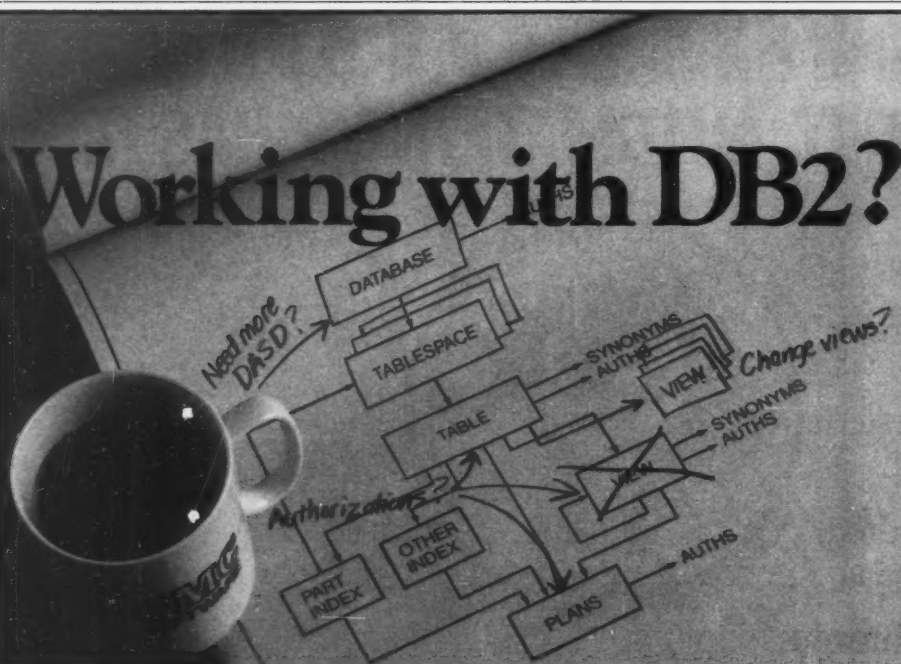
Around the corner: "If the company doesn't require or dictate that you're a profit center, then profit-center-type management practices will need to be in place. Using such techniques keeps you competitive. You're going to carefully select vendors and products to keep expenses down, not unlike if you were offering an insurance product to someone. It's like running a business."



Paul Miller
Manager,
computer operations
New Jersey Natural Gas Co.

Here and now: "One popular buzzword is automated operations or some variation on that. In our data center, I see that as having a very, very gradual occurrence ... getting ourselves into a position where we can run more jobs unattended as opposed to a lot of operator interface."

Around the corner: "I think operations managers are going to have to learn more about voice communications because there seems to be some tendency to combine voice and data communication under one area, and frequently that's going to come under operations."



Work with BMC

DB2 can be a lot more work than you expected with quite a bit less help than you need. But when you've got BMC Software's comprehensive set of data base administration tools—which include standard inter-

faces and integrated function—you can reduce your costs and make your work fast, easy and error-free.

DB2 ALTER—provides complete support for changing, copying and migrating DB2 data structures; includes data conversions, authorization-id switching and restart capabilities.

DB2 CATALOG MANAGER—gives quick and easy catalog information, execution of SQL DDL and DB2 utilities, audit logs and extended SQL function.

DB2 DASD MANAGER—controls the life cycle of physical objects with comprehensive space analysis statistics; also includes space estimation, AMS command and utility jobstream generation and action triggers.

DATA PACKER™/DB2—reduces DASD requirements for DB2 tables an average of 30% to 70%; reduces EXCPs.

DB2 REORG PLUS—reorganizes DB2 tables significantly faster than the supplied DB2 utility; provides dual image copy and statistical history.

For more information or to begin a 30-Day-Plus Free Trial of any or all of these products, complete and return this coupon or call BMC Software, Inc., **The Complete DB2 Company.™**

In the U.S. and Canada: **1-800-841-2031**
In Texas, call collect: 713-240-8800 Japan (03) 837-8651
France (16-1) 48 77 77 77 United Kingdom (0276) 24622
Italy (02) 46193645 West Germany (069) 664060

© 1989 BMC Software, Inc. All rights reserved.

BMC Software, Inc.
P.O. Box 2002
Sugar Land, TX 77487-2002
1-800-841-2031

BMC
SOFTWARE

Contact me about:

Free

Trial

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

☐

Name _____

Title _____

Company _____

Address _____

City _____

State/Prov. _____

Zip/PC. _____

Phone _____

CW

DISOSS

ONLINE HUP UPDATE

- Add, Update, Delete, List users
- Works while DISOSS is active
- CICS transaction and PS/CICS exit
- Free 30-day trial



TBS Software Inc.
249 Tempo Avenue
North York, Ontario
Canada M2H 2A9
(416) 221-5140

Attention: VAX/VMS users.

Before you move to a RISC/UNIX solution,
consider this:

- ☐ Sun has seven years of leadership in UNIX development.
- ☐ Sun has made a seven-year commitment to distributed computing.
- ☐ Sun has invested four solid years in SPARC™ based RISC development.
- ☐ Sun has hundreds of applications already running under the SPARC RISC architecture.
- ☐ Sun has the broadest family of RISC/UNIX products with our SPARC Sun-4™ family.
- ☐ Sun has built an entire product line around non-proprietary versions of SPARC and UNIX.

In fact, Sun believes so much in SPARC, UNIX and the future of truly open computing, we've invested heavily there. But not a bit in proprietary systems. And Sun has it now.

So, VAX/VMS users, before you move to just any RISC/UNIX solution, call Sun: 1-800-223-6736, or in California 1-800-322-6736.



Systems for Open Computing.™

© 1989 Sun Microsystems, Inc. Sun, SPARC, and Systems for Open Computing are trademarks, and Sun Microsystems and the Sun Logo are registered trademarks of Sun Microsystems, Inc. UNIX is a registered trademark of AT&T. VAX and VMS are trademarks of Digital Equipment Corporation.

**“Look, any DSU is
going to work for you most
of the time.**

**Most of the time?
That's like playing
Russian Roulette with
your data.”**

—Marylou Cincinelli, AT&T DSU Product Marketing Manager

“There are plenty of companies out there selling data service units that are almost as good as AT&T provides.

Almost as well built.

Almost as accurate.

Almost as reliable.

But, since when is ‘almost’ good enough for your company’s data networking? AT&T DSUs are specifically designed to work in tandem with AT&T DATAPHONE® Digital Service for a level of



dependability unmatched in the business.

How does that make your life easier? You can control and collect diagnostic information from one central point, and with only one vendor providing your lines and equipment, service problems can be greatly minimized.

You can even have automatic trouble reporting through an AT&T Data Maintenance Operation and Control Center

(Data MOCC) to help you monitor your entire system 24 hours a day.

That adds up to increased productivity for all your company's data operations. All because of having the right DSU.

Amazing, isn't it?"

For more information about AT&T DATAPHONE II DSUs, see your AT&T Account Executive, your authorized AT&T Reseller, or call 1 800 247-1212, ext. 719.



AT&T

The right choice.

Care and feeding of specialists

BY PETER BERKELEY

Like it or not, the role of data centers is changing, from one of manual-intensive operations to one of support and service delivery.

Where once sequential tape drivers dominated the computer room landscape, there are rows of mass storage direct-access devices, which make data storage and retrieval much more expedient. As a

Berkeley is director of education products and services at Operations Technology Corp., an MIS consulting firm in Southboro, Mass.

result, tape operators and tape librarians are, for the most part, on the decline.

Data entry personnel, print operators, bursters and de-collators are suffering similar fates, as more data centers transfer responsibility for both input and output back to users.

Although the value of such labor-intensive data center functions is declining, data center staff have not reached a dead end. The transformation of organizational computing is opening up new opportunities for retooling the skills of existing staff. If they haven't already, data center personnel will soon be asked to perform

new kinds of functions demanding new kinds of skills. They will be asked to perform as highly skilled knowledge worker professionals.

Users demand more

Users are coming to expect and demand higher levels of service, and most of the activities of data center staffs in the future will be geared toward meeting those demands. Typical functions will include monitoring and maintaining service delivery levels; providing appropriate user interfaces; managing physical databases and communications environments; and training users in the use of hardware and automated end-user-computing tools.

The way these functions sort themselves out will be roughly as follows:

Computer Operations, as we know it today, will become highly specialized, with functions that relate specifically to direct operation of computing resources. Direct Operations will continue to be the core of the data center, with responsibility for hands-on operational activities such as console operations, tape handling, I/O, job scheduling and micrographics.

Maintaining the operational capability of Direct Operations will be the job of Operations Support. This area will perform many of the activities that now tend to distract Direct Operations from its main mission — network control, physical database management, resource accounting and configuration management, user Help Desk services, performance change and problem management.

Technical Services will continue to focus on installing and applying fixes but will assume added responsibilities. These will include jobs such as management of installed database and teleprocessing environments, network support and access methods and support for the growing base of end-user software resident in both the data center and Information Centers.

Management of the data center will also evolve to include a critical planning component, with far-reaching implications for information technology usage across organizations. This function, if it is given the proper support and authority, should be invaluable in ensuring the alignment of computing resources with business goals and directions. Ultimately, the Management and Planning area will be responsible for transforming the data center into a provider of computing power and service to organizations.

Finally, there must be an Administrative Services Group to provide the largely generic administrative and clerical functions that will be required — data center administration, vendor relationships, documentation libraries and so on.

Human resources lacking

Unfortunately, not many companies currently have adequate formalized human resources management programs for the data center. And, if they are not equipped to meet current needs, they certainly will not be prepared to tackle the much larger planning issue of minimizing the negative impacts of change and transformation on this scale.

Information systems managers must take a number of actions to stave off long-term problems in data centers. These include the following tasks:

- Providing the right environment and tools to foster rapid staff development.
- Formulating a clear definition of how job functions will change and what skills will be needed to perform the new tasks.
- Developing an aggressive and focused training program that will make it possible for data center staff to acquire the skills they need to remain viable and contributing members of the organization.
- Creating a succession management program that will both protect the center against disruption in critical service functions and serve as a baseline for the development of clear career tracks for data center staff.

With functions in the computer center becoming highly specialized, it will no longer be possible to shuffle staff in an arbitrary fashion. The evolution of computer centers and organizational computing will stall if trained computer personnel are not on board and adequately equipped. •

SIEMENS

"Our policy is 24 hour turnaround on customer claims. Thanks to Siemens high-speed laser printer reliability... we're covered."

"Members Insurance Group is a rapidly growing firm that provides property, casualty and life insurance to more than 270,000 policy holders throughout Texas, Oklahoma and New Mexico.

In an industry dominated by Fortune 1000 companies, we've "staked our claim" in the insurance market by providing quality, speed of service, and the clincher... a 24 hour insurance program that guarantees 1 day confirmation on every new policy, addition or change.

When we launched our 24 hour program, we knew it couldn't be done with our existing impact printers. The solution was clear... laser technology. Unfortunately our choice of another leading vendor resulted in disaster. Downtime disrupted our entire cycle of operations... no matter what repairs were made.

As Vice President of Corporate Information Systems I was

charged with resolving the problem. So I turned to Siemens. We installed a Siemens 2300 Model 2 laser printer, and since then... we've had uptime all the time.

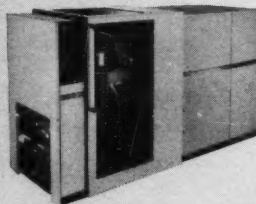
Today, our Siemens printer produces 1 million feet of output every month. We never miss a production window. And best of all, with Siemens advanced features we were able to reduce nightly print time by 3 hours and increase productivity beyond our greatest expectations. That's what I call reliability.

24 hour turnaround? Thanks to the Printer Professionals... we're covered."

Jerry Thompson

Jerry Thompson
Vice President
Corporate Information Systems
Members Insurance Group

High-speed laser printing systems



Contact the Printer Professionals at:

Siemens Information Systems, Inc.
Peripheral Systems Division
240 East Palms Road
Anaheim, CA 92805
(714) 991-9700

CC3080-C19 WLM 837

"...We know Computerworld reaches more decision makers in more of our target markets. And we know it's working."

— Bob Healy
Vice President/Marketing
Relational Technology



Relational Technology, based in Alameda, California, was one of the first companies to be devoted solely to the relational database market. And with its INGRES family of products—the most advanced distributed data management and application development system portable to all major computers—installed in over 8,000 systems worldwide, Marketing Vice President Bob Healy likes what he sees.

He also likes the fact that last year the company enjoyed a 90 percent jump in sales over 1986. Bob says this success comes from positioning a quality product in the right place at the right time in a dynamic marketplace. And the right place for ad-

vertising, he explains, is *Computerworld*.

"We advertise to build brand recognition — and to position our products clearly in a buying marketplace. With the types of products we market, we're not going for immediate responses to every ad. We just want potential customers to think of us when they need relational database tools.

"To accomplish this, we've made *Computerworld* our flagship advertising vehicle. We chose it because we know *Computerworld* reaches more decision makers in more of our target markets. From MIS/DP management to general manage-

ment — and at all levels — it's read by the people who are doing the buying.

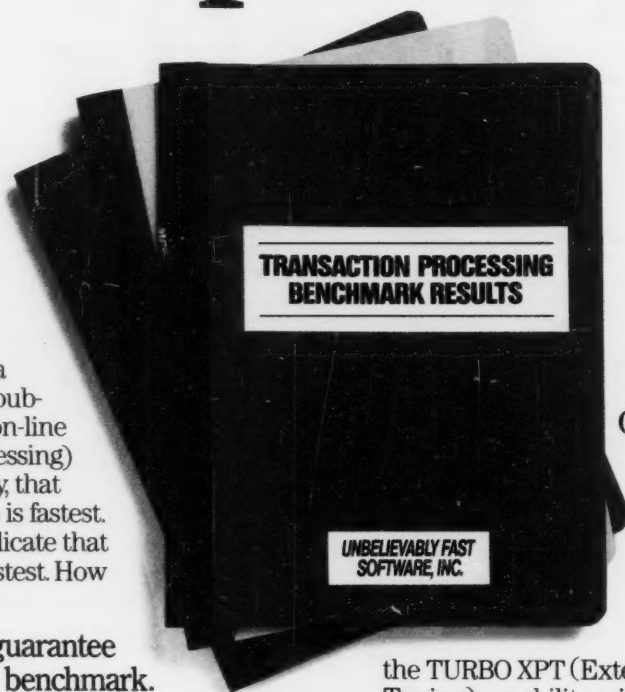
"And we know it's working. Studies have proven that our *Computerworld* advertising is creating higher reader recall — and that's exactly what we want. So for the future, *Computerworld* will continue to be our principal vehicle for getting our advertising message across."

Computerworld. Every week we help more suppliers reach more buyers in the computer market. We're working for Relational Technology, and we can work for you. For all the facts, call your *Computerworld* sales representative today.



**The Newspaper of Record
for Information Systems Management**
Boston (508) 879-0700/New York (201) 967-1350/
Washington D.C. (703) 280-2027/
Atlanta (404) 394-0758/Chicago (312) 827-4433/
Dallas (214) 233-0882/Los Angeles (714) 261-1230/
San Francisco (415) 421-7330
An IDG Communications Publication

Others talk about database speed.



Every time a DBMS company publishes an OLTP (on-line transaction processing) benchmark study, that company's DBMS is fastest. Which would indicate that every DBMS is fastest. How can that be?

A straight guarantee beats a slanted benchmark.

The fact is, a DBMS that's fast on a benchmark may not be up to speed on your application. Unless the DBMS provides tuning capabilities that allow you to fine tune your application for maximum speed.

That's where INFORMIX-TURBO shines. And that's why we can guarantee it will run on your new OLTP application faster than any other UNIX® Relational DBMS. Or we'll give you your money back.

Fine tuning makes OLTP applications fly.

Even before tuning, INFORMIX-TURBO is fast. Its optimizer automatically provides speedy access to data.

But, frankly, it's the TURBO XPT (Extended Performance Tuning) capability within INFORMIX-TURBO that enables us to offer you this guarantee. Very simply, it provides more tuning features than any other UNIX RDBMS.

Including, for instance, more locking options than any other RDBMS. You can specify granularity, severity and duration of locks, giving you total control over how each lock affects each user, as well as overall application speed. Moreover, you can tune in even more speed by adjusting the size of your

Please send me the INFORMIX-TURBO Guarantee InfoPak,
including your free booklet,
"How to Benchmark and Tune an OLTP Application."

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____ Phone _____

Please check the boxes that apply to you:

- | | |
|--|--|
| <input type="checkbox"/> Business User | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Over 1000 employees | What kind of hardware/operating system do you use?

_____ |
| <input type="checkbox"/> 100 to 1000 employees | |
| <input type="checkbox"/> Less than 100 employees | |
| <input type="checkbox"/> VAR/Developer | I plan to purchase a DBMS product: |
| <input type="checkbox"/> Computer Reseller | <input type="checkbox"/> within 6 months |
| <input type="checkbox"/> OEM | <input type="checkbox"/> 6 months or longer |
| <input type="checkbox"/> Gov't. Organization | <input type="checkbox"/> do not plan to purchase |
| <input type="checkbox"/> Educational Institution | |
| <input type="checkbox"/> Student | |



*1 for good reason.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 2502 SHAWNEE MISSION, KS

POSTAGE WILL BE PAID BY ADDRESSEE

Informix Software, Inc.
P.O. Box 15998
Lenexa, KS 66215-0998



Only Informix guarantees it.



INFORMIX-TURBO PERFORMANCE GUARANTEE

*"Informix guarantees that our INFORMIX-TURBO database engine will run your new OLTP application faster than any other RDBMS, or we'll give you your money back."**

shared memory. Thereby avoiding time-consuming physical disk access.

Performance tuning is easy with the right tools.

TURBO XPT includes a full-screen, menu-driven tool that lets you monitor application performance, locate bottlenecks, make precise adjustments and then observe the effects of your adjustments as your application runs.

What's more, we offer a special Turbo training course to help get you started. Plus all the on-going technical support you'll ever need.

Free booklet, "How to Benchmark and Tune an OLTP Application."

For a free copy of our new guide, "How to Benchmark and Tune an OLTP Application," and our INFORMIX-TURBO Guarantee InfoPak containing the details and conditions of our INFORMIX-TURBO money-back guarantee, call or write Informix Software, Inc., 4100 Bohannon Drive, Menlo Park, CA 94025, 1-800-331-1763, ext. 3800.

And stay tuned for a fast response.



INFORMIX

#1 for good reason.

*Terms and conditions are included in our INFORMIX-TURBO Guarantee InfoPak.
Informix is a registered trademark of Informix Software, Inc. UNIX is a registered trademark of AT&T. © 1988, Informix Software, Inc.

Data centers face relative deprivation

BY GARY ROBINS

Data center budgets will continue to move in an upward direction, but total corporate spending on technology, both inside and outside the MIS organization, will increase at a greater rate.

That is the projection of Douglas Brockway, a principle at Nolan, Norton & Co. in Lexington, Mass., who maintains a database of personnel, equipment and software costs in more than 200 large-

Robins is a free-lance writer based in Northfield, Minn.

scale data centers.

According to Brockway, there are two reasons for the slowing of data center outlays relative to corporate expenditures on personal, interactive and networked technologies.

First, the unit cost of the total amount of work being done by data centers is declining. Brockway, who defines the unit cost of work in terms of units of consumed processor power, or millions of instruction per second, says that unit costs within his sample are dropping at an average of 20% a year; the decrease is estimated at about 10% to 15% a year for larger

data centers.

A second factor is that even greater economies are being achieved with personnel in data centers. "The head count required to support a unit of work in the data center is going down even faster than unit costs," Brockway observes.

A smaller increase is a far cry from an actual drop, however. Even though the boom may have passed, in 98% of the data centers that Brockway follows, "budgets are still rising in raw dollars" and he does not expect the figures to suddenly turn negative.

One stabilizing factor is that the whirl-

wind activity going on outside the data center actually creates additional work inside that area. Users must be connected to mainframes; files must be accessed, supplied and maintained. "I think of the data center as providing a product to a marketplace," Brockway says, "and the marketplace demand keeps going up."

Local alternatives

Why bring new work to the data center when local alternatives exist? According to Brockway, as the unit costs drop, the data center becomes a more attractive alternative for users. Rather than run an application on a departmental system, users find the cost of data center computing increasingly less expensive. There is also a clear trend to use the data center as an "unlimited" repository for data.

As the market grows, the effect is to accelerate system turnover in data centers as applications start to require significantly more virtual storage, relational capabilities and communications features.

Experts say data centers will be spend-

Our DB2 software is up and running.

Everyone else is still making promises. Integral Systems DB2 based Human Resource application software is up and running. It has been since 1987. In fact, IBM selected Integral Systems as its first Human Resource Business Partner specifically for our DB2 software. Which is exactly what you'd expect from the number one Human Resource company in the industry.

The Perfect Application

After all, employee information is the heart of corporate data and must be easily accessible and well structured. Our DB2 software allows you to select exactly the program components you need -- Personnel Management, Payroll

Processing and Reporting, and Benefits Administration are all available. All these products can be connected to our powerful family of other mainframe and microcomputer products.

The Leader

For 16 years we've dedicated ourselves exclusively to Human Resource software. What we deliver today, others will still be talking about tomorrow. So call our toll-free number now for a fact-filled brochure. In the U.S., call (800) 334-8199. In California, (800) 334-8198. Locally and in Canada (415) 339-3980.

Sales and support offices located throughout North America.

INTEGRAL SYSTEMS

The Deciding Factor

DB2

Authorized
Application
Specialist

WHAT THE end user will see in his budget will be a stabilization or low percentage rate growth of expense for hardware but a much higher rate of growth on the software side."

PERRY HARRIS
THE YANKEE GROUP

ing the most on software and service during the next few years. Perry Harris, director of information systems at The Yankee Group in Boston, for example, expects a dramatic shift from investment in iron to investment in software and support.

This will be especially true within the IBM arena, he says, because IBM will be pressing to derive a higher percentage of its income from software revenue, including fees for maintenance, system software support and the actual monthly cost of that system software. IBM is also expected to increase both the number of software offerings and the bundling of those products, Harris says.

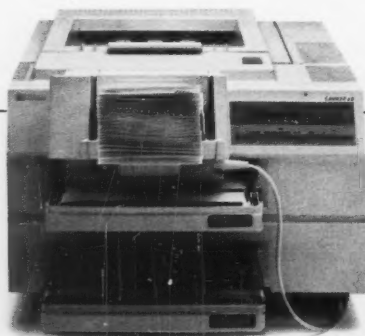
"What the end user will see in his budget will be a stabilization or low percentage rate growth of expense for hardware but a much higher rate of growth on the software side," he says.

Arnold Farber, president of Farber/LaChance, Inc. in Richmond, Va., says he feels that part of the increase in software expenses will be directed at the effort to pare salary costs through automation. While data center equipment costs have come down, the cost of salaries has conspicuously increased, Farber observes, and that makes staff reduction through automation a very attractive idea for many organizations.

Farber estimates that, so far, only 10% of the total market has embraced unattended operations as a goal, but he predicts that interest in automation will continue to gain momentum during the next five years. One thing that will spur interest, Farber says, is the emerging concept of trying to turn data centers into profit-making operations. •

One of the most important reasons
for buying our new LaserJet IID printer
is on the other side of this page.

One of the most important reasons
for buying our new LaserJet IID printer
is on the other side of this page.



The latest member of the HP LaserJet printer family prints on **both** sides of the paper. But that's just the icing on the cake.

The LaserJet IID printer is full of new ideas for making paper-handling easier and more efficient.

An envelope feeder accessory, for one. Instead of having to feed envelopes manually, our new printer does it automatically.

You wanted more paper trays. So the LaserJet IID printer has two of them, each with a 200-sheet capacity. Give us more fonts, you said. And LaserJet

Series II compatibility. Done!

So now you have a choice of two HP LaserJet printers. Both with that superb quality for text and graphics you've come to expect from Hewlett-Packard.

All good reasons to call 1-800-752-0900, Ext. 297A for the name of your nearest dealer.



**HEWLETT
PACKARD**

IN DEPTH

Tracking IBM's gateways

Which strategy will prevail in tomorrow's Token-Ring networks?

BY ZAK KONG

For MIS managers implementing LAN-to-host gateways, predicting which of IBM's major gateway directions will emerge as the industry standard is crucial. Will IBM's future product strategies emphasize one local-area network gateway alternative over another? Or will the industry leader continue to offer the two solutions it does today?

The answer lies in IBM's recent announcement and current promise of several new products, which should greatly affect the future direction of the IBM Token-Ring LAN as well as its connectivity to IBM's Systems Network Architecture (SNA) host resources.

In a November rollout, IBM announced a high-speed 16M bit/sec. version of the Token-Ring network. And expected soon is a new model of the IBM 3174 cluster controller featuring enhanced Token-Ring gateway capabilities.

On the surface, these product enhancements indicate that IBM's preferred Token-Ring gateway solution will center around the 3174, which has emerged as a very strategic product for IBM, especially in the area of Token-Ring gateways.

But IBM also offers a

capable Token-Ring gateway implementation that uses a PC as the link. And the vast majority of third-party Token-Ring gateways on today's market use a PC, not a 3174, as the gateway.

Same old story

Tracking IBM's product directions has always been difficult. The company never seems to offer just one way to solve a particular application; multiple solutions are a way of life at IBM.

In fact, market research there sometimes means announcing several products and then seeing which alternative —

or alternatives — are embraced by the marketplace. Products that do not catch on are simply downplayed or, in some cases, discontinued altogether. Witness the PCjr.

Or consider IBM's first LAN for personal computers — a broadband network that utilized a bus topology. Called the PC Network, it was not a huge success by IBM standards.

IBM's first serious LAN offering, most analysts agree, was its Token-Ring network. The Token-Ring incorporates a baseband ring topology and a token-passing access method.

At the time of its announcement, Token-Ring was a radical departure from the then-reigning de facto standard, Ethernet, which utilizes a bus topology and the carrier-sense multiple access with collision detection (CSMA/CD) access method.

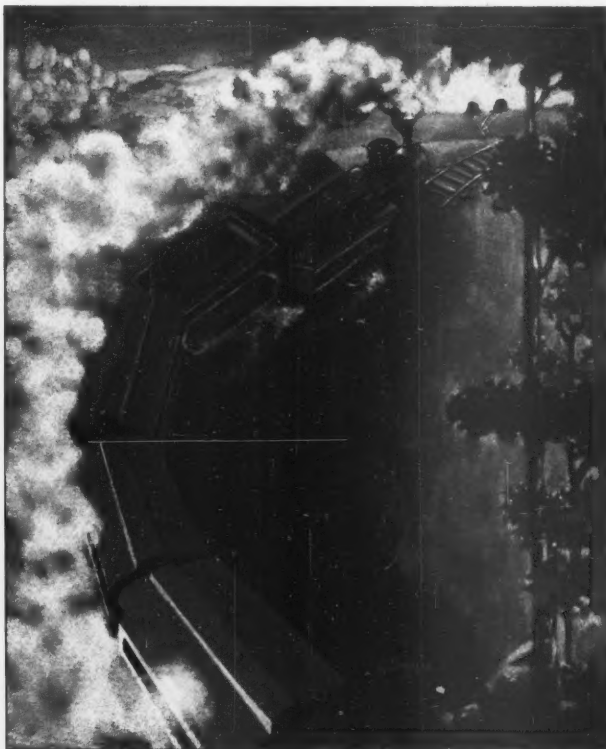
Today, however, the Token-Ring has emerged as the LAN of choice for PC-oriented LAN implementations. According to La Jolla, Calif., market research firm Computer Intelligence, Token-Ring has a larger installed base than Ethernet in those installations interconnecting PCs only. In this segment, Token-

Ring has a 38% share while Ethernet has a 35% share. Clearly, then, determining the gateway choice for a Token-Ring network is extremely important.

A LAN gateway consists of a hardware/software module attached to the LAN that provides a shared communications path to the host mainframe. All nodes on the network can use the gateway to communicate with the host. This provides a cost-effective solution, because each node does not have to have its own separate communications link.

Of IBM's two current solutions for Token-Ring host gateway connections, the first approach uses a designated PC on the Token-Ring, which functions as the gateway. This "gateway PC" communicates with the other "workstation PCs" via IBM's Network Basic I/O System (Netbios) interface.

The second approach, in addition to

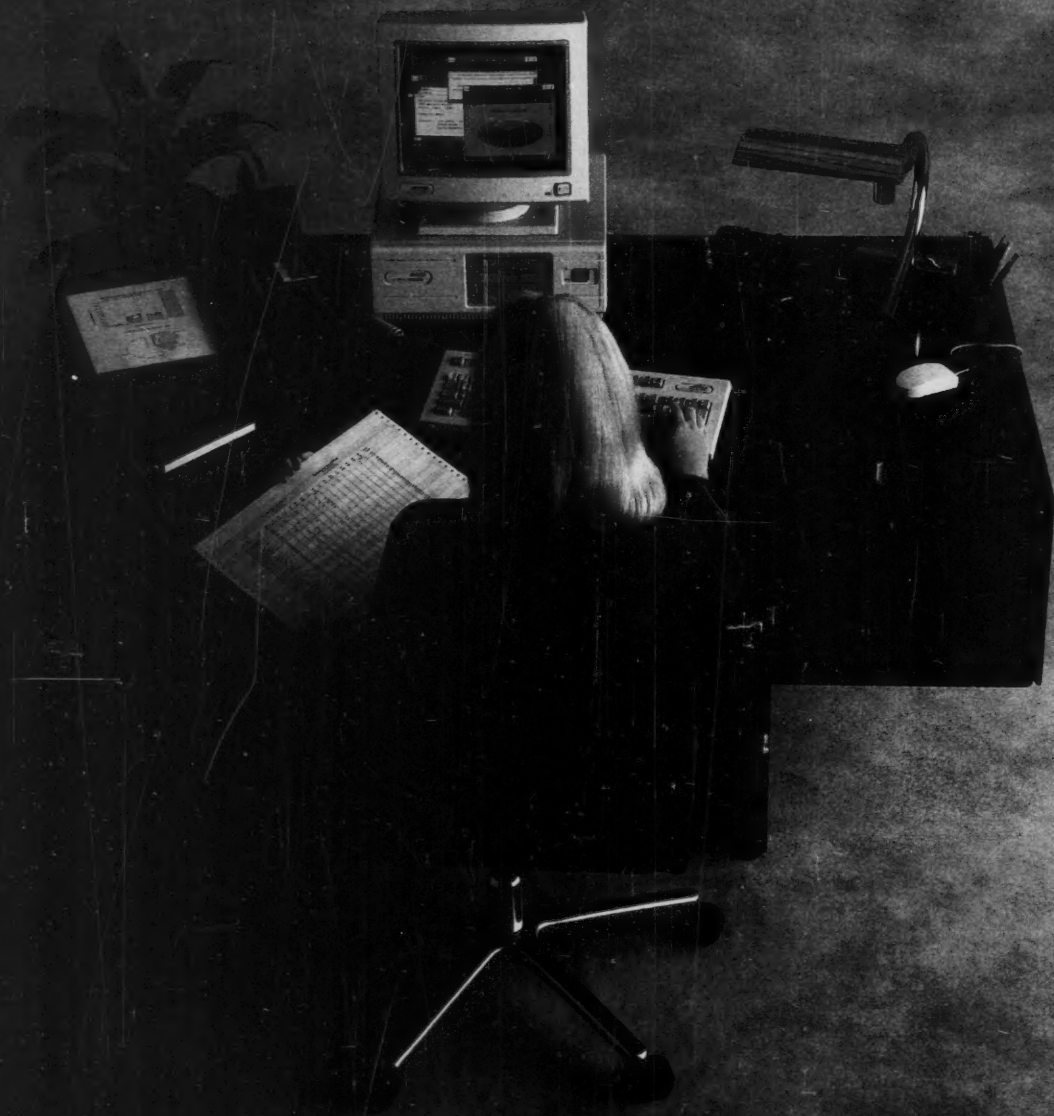


CAROL O'MALLIA

Kong is president of Network Software Associates, Inc., a micro-to-mainframe communications software producer based in Laguna Hills, Calif.

- The user-friendliness/better control debate
- Where do SAA and Netview fit in?
- Rumors of enhanced 3174 controller persist

PC power once reserved
and building rockets is now

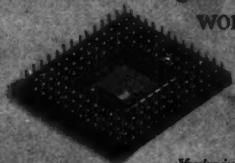


for pondering physics taking care of business, too.

People who work with powerful 386 personal computers used to be called rocket scientists. Now they're also called accountants, engineers, managers and CEO's. Thanks to the new COMPAQ DESKPRO 386/20e.

It delivers 386 power to people whose demanding needs have outgrown their 286 PC's. Plus, it packs this power into a design that fits on your credenza.

Start with speed. Everything in the new COMPAQ DESKPRO 386/20e is optimized to go faster. So you can work faster.



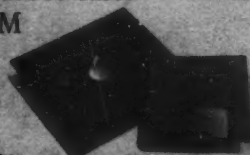
You're in business with a 20-MHz 386 microprocessor.

Its 20-MHz Intel 386™ microprocessor with cache memory is surrounded by the exclusive COMPAQ Flexible Advanced Systems (Flex) Architecture. This high-speed combination runs the world's largest library of software 25% faster than the IBM PS/2 Model 70-121 and other non-cache 20-MHz 386-based PC's. And 50% faster than the IBM PS/2 Model 70-E61 and other non-cache 16-MHz 386-based PC's.

Its 32-bit design also takes 386 software and multitasking operating systems such as Microsoft®



Introducing the COMPAQ DESKPRO 386/20e. 20-MHz 386 performance designed to fit the increasingly sophisticated needs of 286 users.



Choose 5 1/4" and 3 1/2" diskette drives.

Windows/386, MS® OS/2, XENIX® and UNIX® to their maximum potential.

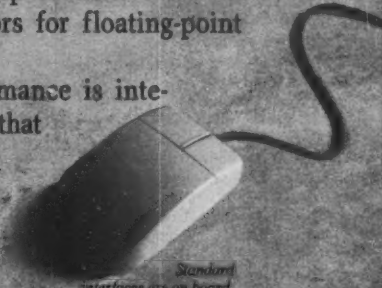
A long list of high-performance features is built in. One megabyte of memory. VGA graphics. Standard interfaces. And support for 5 1/4" and 3 1/2" diskette drives.

Of course you have growth potential. Five expansion slots are available: four for a network card, modem or other devices, and one high-speed 32-bit slot to expand memory in increments up to 16 megabytes.

Need options? Add two high-performance fixed disk drives, with 110 or 40 megabytes of storage; 135- or 40-megabyte tape backups; and high-speed Intel 387™ or Weitek 3167 coprocessors for floating-point applications.

All of this performance is integrated into a sleek design that makes the COMPAQ DESKPRO 386/20e the ultimate space vehicle.

For a free brochure and the location of your nearest Authorized COMPAQ Computer Dealer, call 1-800-231-0900, Operator 75. In Canada, 1-800-263-5868, Operator 75.



Standard interfaces are on board.

COMPAQ is a trademark of Compaq Computer Corporation. Intel, Intel 386 and Intel 387 are trademarks of Intel Corporation. Microsoft, MS and XENIX are trademarks of Microsoft Corporation. MS Windows/386 and MS OS/2 are products of Microsoft Corporation. UNIX is a trademark of AT&T. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. Registered U.S. Patent and Trademark Office. ©1988 Compaq Computer Corporation. All rights reserved.

COMPAQ

It simply works better.

using the 3174 controller, can also use a number of other hardware products — for example, a 3725 or 3745 front-end processor or an IBM Application System/400 — as the physical gateway. In these scenarios, the IEEE 802.2 protocol is used in place of Netbios.

While quite different in implementation, both of these gateway approaches rely on IBM's PC 3270 Version 3 emulation software to achieve 3270 communications functionality. The software is just configured differently, depending on the gateway. To ensure future compatibility, however, a clear gateway choice must emerge.

Before addressing that issue, it is important to take a close look at the standards and technologies involved.

The Institute of Electrical and Electronics Engineers, Inc.'s 802 committee has produced a number of standards relating to LANs: 802.1, 802.2, 802.3, 802.4 and 802.5.

The 802.1 and 802.2 standards are high-level layers that apply to all 802 implementations. The 802.3 through 802.5 layers are lower level and define the LAN media-access method. The 802.3 standard defines Ethernet (CSMA/CD); 802.4 defines Token-Bus and is used almost exclusively in manufacturing environments as defined by the Manufacturing Application Protocol standard; and 802.5 defines Token-Ring.

Another industry standard that is very important to the PC-based LAN marketplace, although not an 802 standard, is Netbios. It was developed as an extension to the IBM PC's BIOS firmware. In a sense, Netbios can be viewed as a high-level alternative to the 802.1 layer.

Netbios has emerged as a de facto standard for PC-only LANs. It is supported by many third-party LAN vendors on LANs other than IBM's Token-Ring. It has allowed a wide variety of LAN-based applications such as host communications gateways and database systems to emerge. And although IBM's OS/2 Extended Edition and LU6.2 will probably emerge as the new standards in this area, Netbios-based applications will probably continue to play a major role. In fact, the OS/2 LAN Manager from Microsoft Corp. will be fully compatible with Netbios.

The gateway alternatives

The first gateway approach IBM offers uses a PC as the gateway, in which a designated PC on the Token-Ring acts as the gateway. It is equipped with a Token-Ring adapter board on the downstream link and a separate communications board for the upstream host connection. This methodology is shown in the top half of the chart above. The Netbios interface is used for communications between the gateway

PC and the workstation PCs.

With such a gateway PC approach, only the gateway PC itself is recognized as an SNA Physical Unit (PU). Each of the workstation PCs on the Token-Ring is designated as a Logical Unit (LU) only, not a PU. Hence, it can be said that SNA stops at the gateway PC.

This type of PC gateway is the most prevalent on the market today. In addition to IBM, several third-party vendors have introduced communications gateways of this type. The PC gateway approach is typically used with smaller Token-Ring installations that interconnect PCs exclusively.

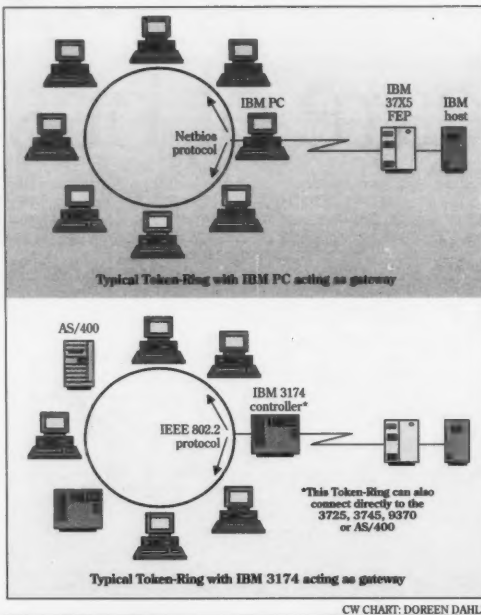
On the higher end are larger Token-Ring installations that interconnect a wide variety of IBM equipment — for example, PCs, minicomputers and controllers — encompassing hundreds or thousands of nodes. In this case, IBM's second approach often comes into play.

This technique literally extends SNA onto the Token-Ring down to the individual LAN node level. Here each communications workstation is designated as a separate PU. The second approach does not use a PC as the physical gateway. Rather, it involves directly attaching the Token-Ring to one of the following IBM hardware products: a 3174 cluster controller, a 3725 or 3745 front-end processor or an AS/400 or 9370 mid-size computer. IBM's Token-Ring Interface Card (TIC) is used to achieve the physical connection to the Token-Ring.

The lower half of the chart above illustrates the second type

Gateways to a network

IBM offers two gateway approaches for the Token-Ring, as illustrated below



of gateway, in which an IBM 3174 functions as the physical gateway link to the host.

To propagate SNA all the way across this Token-Ring, a much finer level of control is required than can be exercised via Netbios. Therefore, the lower level 802.2 protocol is used.

Netbios is a higher level specification than 802.2 and as such is more user-friendly and provides global-type functions.

Therefore, it has emerged as the implementation of choice for most third-party gateway suppliers.

IEEE 802.2, on the other hand, is lower level, which means it is more complicated to work with but provides a much more detailed level of control.

But the two standards are not mutually exclusive. Simultaneous 802.2 and Netbios communications can occur on the

same Token-Ring, although the gateway would still be different.

Having clarified IBM's two LAN gateway approaches, it is also important to understand how three key IBM concepts — the 3174 controller, the Systems Application Architecture (SAA) and Netview — fit into the picture.

The 3174 controller

The 3174 cluster controller has emerged as a strategic product for IBM, not only for 3270 coaxial applications, but also for the Token-Ring gateway.

Of all the hardware that can be used for an 802.2 Token-Ring gateway, the 3174 is the least expensive and therefore will perhaps emerge as the most used product for 802.2 gateways.

From a connectivity standpoint, the 3174 has two sides: the upstream connection and the downstream connection.

The upstream connection can be a host channel attachment, a Synchronous Data Link Control host link or another Token-Ring. Assuming that the downstream connection is to a Token-Ring, then an upstream connection to a host makes the 3174 act as a LAN-to-host gateway. An upstream connection to another Token-Ring makes the 3174 act as a LAN-to-LAN bridge.

The downstream connection can be coaxial or Token-Ring. Coax allows the 3174 to function in its historical 3270 coaxial controller mode. Token-Ring is achieved through the use of the TIC. For downstream connections, the 3174 can retain all its protocol implementation functionality within itself, or else

In this
business,
there's one
coattail
we're proud
to be
riding on.

some of the control can be delegated to downstream devices.

Delegating protocol implementation in this fashion is made possible by a facility called Distributed Function Terminal (DFT). With DFT, attached PCs can communicate with a host using the 3270 protocol and a variety of other SNA protocols. Once the controller goes on-line with the host, all SNA request units are passed through the passive controller and then processed by the terminal device. The DFT acknowledges that the terminal device has built-in intelligence.

DFT allows PCs to communicate via advanced protocols such as LU6.2/Advanced Program-to-Program Communications (APPC) by using newly available software. It allows multiple concurrent host windows. It also opens up the controller link to accommodate other future directions, because DFT assigns the workstation complete control over what data-stream control characters it can handle.

Note that the facility allows the workstation, not the 3174, to determine the LU type. This means that workstations can be attached to communicate in ways never originally designed into the older 3274 controller, the 3174's predecessor. The latest 3174 speculation is that the new model will be DFT-only.

SAA

In creating SNA, IBM established a common blueprint for host communications, defining

how different types of users and computing equipment would communicate. In 1986, IBM set an even bigger goal. Faced with competitors like Digital Equipment Corp. that had managed to keep their computer lines relatively applications compatible, IBM began publishing its SAA, a set of generic specifications designed to define not only computer communications but all computer applications.

At the core of SAA is the premise that software should be portable from one hardware en-

vironment to another without modification. Ultimately — although it is far from implementation — a program for an IBM 3080- or 3090-class mainframe should run on a Personal System/2 micro and vice versa.

SAA's specifications also define a new level of advanced dispersed data processing, namely, cooperative processing. Based on the much publicized LU6.2/APPC, cooperative processing distributes processing loads among different-sized computers within the network, while allowing the systems to talk to each other directly at the operating system level without the need for terminal emulation.

In terms of PC-to-host links, LU6.2/APPC includes the ability to design a very high level of in-

tegration between the PC and the host. A PC program can exchange information with the host by updating or extracting only those elements that are needed, thereby not necessarily requiring complete file transfers. This integration will greatly reduce line costs in many LAN-to-host applications.

Netview
Centralized network management has become an increasingly important concern among those responsible for the management and control of local- and wide-area networks. And while network management tools may not be critical considerations for those implementing a small, 20-node Token-Ring application, for example, they become imperative for those setups running large 802.2 Token-Ring networks that may span upwards of 4,000 to 5,000 nodes.

Netview is IBM's strategic product for network management. Originally announced in May 1986, its first release simply consolidated several existing IBM host-based software tools for network monitoring.

In September, IBM announced Version 3 of Netview, adding functions and making the software easier to use. Netview has now emerged as a powerful system for centrally controlling and managing multiple or interconnecting SNA networks.

DP and communications managers use Netview for a variety of tasks, including tracking and

controlling terminal usage, identifying and reporting hardware problems, testing modems and collecting data on specific network resources. Like SNA and Token-Ring, Netview is rapidly becoming a de facto standard within the industry.

In a LAN environment, it is interesting to note that the product can only support Systems Services Control Point-to-PU sessions. This means that Netview can keep track of SNA PU devices only, not LUs. Therefore, in a Token-Ring using a PC as a gateway, Netview can only determine the physical location of the gateway PC, which represents the PU. If individual workstation PCs are moved with the Token-Ring, Netview has no way of tracking them because each node PC represents an LU, not a PU.

In an 802.2 Token-Ring in which each PC has its own PU address, Netview provides complete control over each workstation PC. If a workstation PC is physically moved, Netview can determine its new location. This is important in large networks in which network management has the responsibility of keeping track of thousands of PCs.

IBM's direction

IBM derives most of its revenue from mainframe products, not PCs. Therefore, many industry observers agree that IBM's overriding product strategy has always been to overload the mainframe. By so doing, IBM is able to sell highly profitable mainframe enhancements.

But how does this strategy translate to the LAN gateway

marketplace? A case could easily be argued that IBM will drive the market toward 802.2 Token-Ring gateways using hardware like the 3174.

With the centralized Netview control of an 802.2 Token-Ring, growing and expanding network applications is a more manageable undertaking. And the more applications you add, the more mainframe resources you consume, which implies an IBM strategy of overloading the mainframe and thereby requiring profitable host upgrades and enhancements.

IBM clearly understands centralized control. So do corporate MIS managers who have long lived in the world of centralized control and tend to view the world from the host's point of view. PC vendors, on the other hand, tend to view the world from the PC side, in which decentralization seems more desirable.

This scenario seems to indicate that while PC vendors attempt to drive the market toward PC-based Netbios gateway solutions, mainframe-oriented IBM would benefit by driving the market toward centrally controlled Token-Ring implementations with 802.2 gateways.

Further, the previous version of IBM's Token-Ring ran at 4M bit/sec., while the new version

NEVER underestimate the unpredictability of the Armonk giant. IBM may, in fact, push Netbios solutions.

Introducing IPL's AS/400™ memory card.

You can't get much faster than IPL Systems. Almost as soon as IBM announced the AS/400™ we had a low-cost alternative for expanding AS/400™ memory. Available immediately.

But don't be surprised that we were one of the first companies to offer better-priced products for the AS/400™. We've been designing IBM-compatible equipment for over fifteen years, so we've become experts at nipping at IBM's heels.

And of course, we still offer an unlimited lifetime replacement warranty on all of our products, an assurance that's infinitely longer than IBM's 1 year warranty. So contact us today for more information about the 5500 Series Memory Cards.

And the next time IBM gets out its hat and cane for a product announcement, remember that IPL is looking right over their shoulder.

IBM and AS/400 are registered trademarks of International Business Machines Corporation.



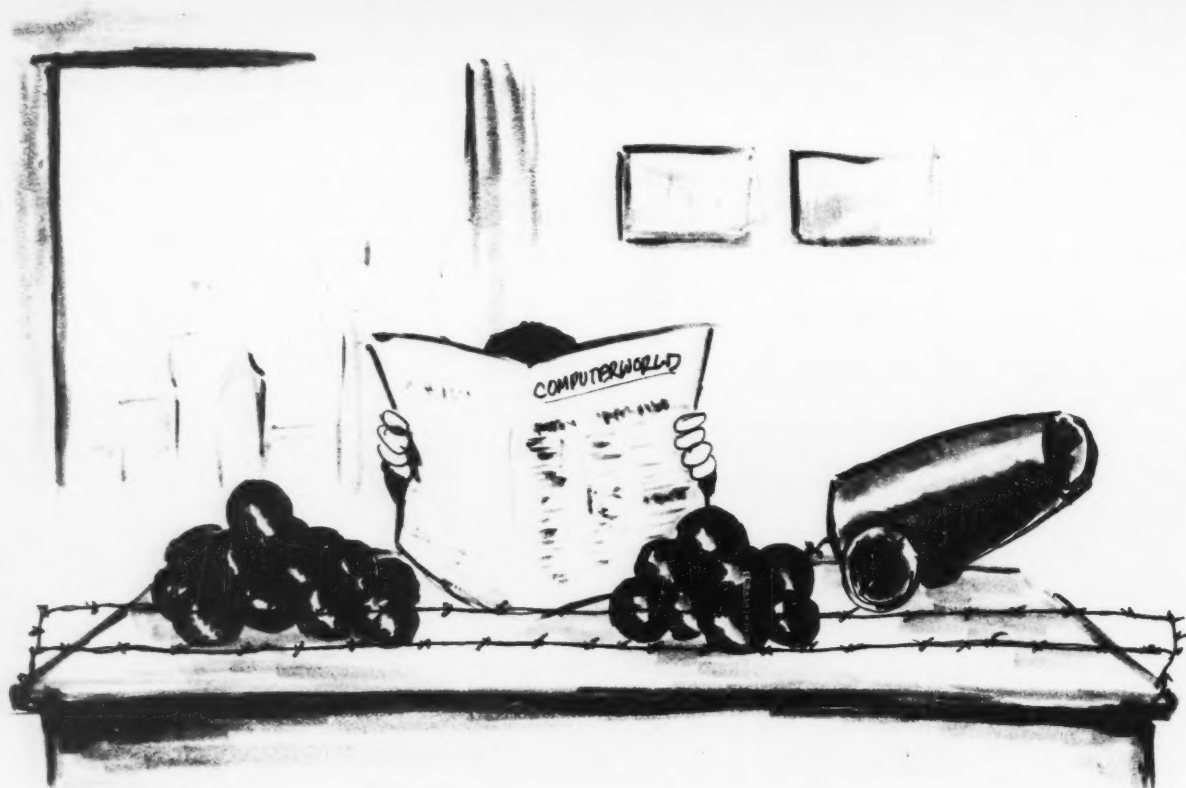
360 Second Avenue Waltham, MA 02154 1-800-338-8ipl In MA (617)-890-6620



will run at 16M bit/sec. It has been rumored that, if it is indeed upgraded, the new 3174 will support both the 4M bit/sec. and 16M bit/sec. Token-Ring networks and will therefore be able to act as a LAN bridge between the two, in addition to its LAN gateway functionality. The enhanced controller should also include more intelligence and larger memory capacities, allowing it to become a more complete SNA node, with added routing and network control functions.

Thus, these product enhancements would seem to provide additional credence to the theory that IBM will be moving the market toward 802.2 Token-Ring gateway implementations involving distributed functionality, 3174 gateways and centralized Netview control.

But that scenario may be wrong. Never underestimate the unpredictability of the Armonk giant. IBM may, in fact, push Netbios solutions. While waiting for a further sign, MIS and communications managers will have to base today's implementation decisions on the knowledge currently at hand. •



Jenkins was disinclined to share his copy of Computerworld with his colleagues.

And we don't blame him. With news and information so vital to his work, he wants to hang on to his copy.

That's why you need your own subscription to **COMPUTERWORLD**.

**Find out what you need to know.
When you need to know it.**

You'll see what products breakthrough. And what products break down. You'll get the news and views of the industry. And the ads and advice of its leaders.

In fact, with **COMPUTERWORLD** on top of your desk, you'll be on top of your job.

And there's more...

In addition to your 51 issues of **COMPUTERWORLD**, you'll get — absolutely **FREE**...

Bonus issues of **COMPUTERWORLD FOCUS** — an in-depth exploration of a single critical topic: communications, data security, PC's, connectivity, and more. Not available on newsstands; these issues are sent to **COMPUTERWORLD** subscribers only.

Our special Spotlight section. Head-to-head product comparisons with an at-a-glance ratings chart. Security products, LANs, graphics workstations ... a different product each time.

Order now. Use the postage paid subscription card bound into this issue ... because not having your own **COMPUTERWORLD** can be dangerous to your career.

COMPUTERWORLD

375 Cochituate Road, Framingham, MA 01701

MANAGEMENT

TAKING CHARGE

James Young

What more can MIS do?



Though we may have become used to them, the boundaries of MIS responsibility are by no means stationary.

Traditional roles of analysis and programming are being challenged by non-MIS groups. There are also the well-publicized battlegrounds of end-user computing and departmental computing. These encounters are perceived as being of profound importance and are usually settled based on strategic issues or at least in a considered way.

There are, however, other demarcation discussions that get less attention and are not blessed with such thoughtful evaluation. These usually involve companywide ancillary responsibilities for which MIS may provide a suitable home and can include the mail room, company print shop, telephones and office service duties.

Pairing such bits and pieces with MIS can prove to be more important to MIS than we might at first think. On the posi-

Continued on page 88

Export's about-face

Automation wins accolades for maligned bureau

BY MITCH BETTS
CW STAFF

Three years ago, the U.S. Department of Commerce was doing such a poor job of processing export licenses — most took 46 days, and some applications were lost not once but three times in a row — that critics said the job should be handed over to the Pentagon.

"But I'm a competitive son of a bitch, and I didn't want to give away something like that," says Lee Mercer, who was hired by the department as deputy undersecretary for export administration to revamp the operation and oversee automation of its reams of paperwork.

What Mercer and John Young, director of information resources management (IRM) at the Bureau of Export Administration, did was to turn the department's black eye into a Gold Medal Award for several successful automation projects. Today, the department processes export licenses within five to 14 days, and none fall through the cracks.

The bureau's job is to review business applications for export licenses, determine if they meet export-control regulations preventing the diversion of high-technology products to the Soviet bloc and issue the approved licenses as quickly as possible. It issues about 100,000 licenses a year, representing \$100 billion in sales by U.S. companies, or roughly 35% of U.S. merchandise exports.

Presenting the Gold Medal Award to the IRM staff in October, Commerce department executives praised the electronic licensing system as the envy of U.S. trading partners — Japan, Germany and the UK are copying the bureau's system — and for helping to speed U.S. exports to foreign markets.

Brickbat bashing

That praise is a far cry from the brickbats hurled at the department a few years ago.

"Some people told me I shouldn't take the job," Mercer says, "because the unit had such

PROFILE

John Young and Lee Mercer



MANUELLO PICANELLI

Positions: Young (left) — Director of information resources management.

Mercer — Deputy undersecretary of export administration, U.S. Bureau of Export Administration.

Philosophies: Young — Recruit influential "change agents" in the user organization to promote automation. Mercer — Automation projects need decisive leadership from the top.

a poor reputation. And some people told me that John Young's group did not have the capacity to automate the system."

Actually, in 1984, Young had drafted a visionary plan for computerizing the paper-intensive process, but he lacked the political clout to get it moving. A few years later, that clout was provided by Mercer, who was described by one bureau source as "a tough guy in a situation that needed a tough guy."

"What I added to this equation is impetus and support from the top," Mercer says. "Without the support of top management people, who have a view of where they want the organization to go, the IRM will run into

the natural roadblocks of everybody defending their turf."

For example, in order to forge agreements between the users and the IRM office, Mercer decided to chair the steering group and require users to send a representative to every meeting because key decisions would be made at these gatherings.

No one claimed that automating the process of export licensing would be easy. Young says there were five different studies conducted from the early 1970s to 1983, and all concluded that it was impossible to automate 100% of the process.

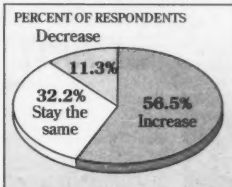
The key to success, Young and Mercer agreed, was to try to

Continued on page 89

Data View

Budgets stable or growing

The vast majority of 150 MIS executives surveyed indicated that their 1989 budgets would not sink below 1988 levels



SOURCE: THE SIERRA GROUP, INC.
CW CHART: DOREEN DAHLE

Former quarterback Tarkenton's advice for building winning management team

BY DAVID A. LUDLUM
CW STAFF

ATLANTA — Taking the field for the Super Bowl may seem far removed from the realm of managing information systems, but one person familiar with both worlds contends that some principles contribute to success or failure in either.

That is the view of Fran Tarkenton, who three times stood in the spotlight shared by yesterday's Super Bowl quarterbacks on his way to National Football League career records for completed passes, passing yards and touchdown passes. Along the way, he also started a management consulting firm, Tarkenton & Conn, Inc., now 19 years old and employing 25 professionals.

Tarkenton credits notions about managing people for much of his gridiron stardom and says the same ideas make businesses work better.

Tarkenton, 48, who is also chief executive officer of Knowledgeware, Inc., a vendor of software development tools, says MIS organizations in particular need to improve their management of people. "In data processing, we are behind in that regard," he said in addressing the Society for Information Management's (SIM) annual conference.

Tarkenton devotes most of his attention to Knowledgeware, but his counsel to IS managers dwells on managing people. In an interview, two books and speeches to groups including the

SIM and Data Processing Management Association, Tarkenton discounts methodologies such as quality circles and management by objective. They are valuable, he says, but are not as critical as managing people effectively, which requires teamwork, accountability and feedback.

He acknowledges these bromides are not new, but he emphasizes the need to implement the ideas. A one-time television host, Tarkenton draws laughs rather than yawns in imparting the message to lunching conference-goers by peppering it with relevant anecdotes from his football career. He drives home points in the \$15,000 talks with a rhythmic delivery and hushed tones suggesting his upbringing

as the son of a Pentecostal preacher in Athens, Ga.

"Technology," he told the SIM members, "only helps us in data processing or [manufacturing] plants when people buy into it and use that technology. We have to have the ability in data processing to manage change."

People resist change from uncertainty over how it will affect their status and security, Tarkenton says. But leaders can get workers to buy into change by bringing them into the process — listening, understanding how the change will affect them and making them part of a team.

Building teams also helps bring out workers' ideas, and Tarkenton attributes his reputation as a crafty play-caller to tak-



Tarkenton of old

ing advice from teammates.

Ray Abi, a consultant at Unitel International Corp. in New Canaan, Conn., who arranged a talk by Tarkenton, relates such notions about teamwork to developing systems.

Continued on page 89

Young

CONTINUED FROM PAGE 87

tive side, they can complement an MIS service operation, build economic and management synergies and exhibit MIS skills. On the other hand, they threaten to distract our attention, waste our energy and cast a menial reflection on the department. Therefore, despite the lack of traditional attention toward these areas, MIS should take an interest in the question of whether they belong under MIS.

The organizationally overlooked

This is not to imply that MIS is in a position to engineer the acquisition of additional duties. These activities tend to be small but have a tradition of being independent. Control of these functions is largely uncontested, and therefore they may be very comfortable in some organizational niche. Since they are small, the rest of the company perceives them as relatively unimportant.

It is during these periods of customer dissatisfaction that realignment becomes popular. It is also when the firm considers the merits of MIS assuming new duties, and MIS must be ready to handle them when drafted. In addition, MIS must recognize and then fend off inappropriate assignments. This process of introspective analysis is a therapeutic exercise and may uncover affinities that MIS may have with selected areas.

Usually, MIS will see no reason to take over other functions. MIS should get away from viewing isolated pockets of service activities as potential trophies in the MIS fiefdom and see them as entangling activities that we have no business trying to manage. With this jaunted attitude, the few occasions calling for organizational cohabitation will stand out on their own merits. The following guiding principles may show whether it is wise to adopt any new duties through realignment:

- **Priority.** Any new duty must pass the importance test. Is the task critical enough to commandeer precious MIS time and resources? Is it more important than those things that MIS will now not be able to get to? Is this how top management would invest MIS resources?
- **Integration.** One obvious reason for MIS's assumption of an organizational responsibility is the merging of technologies. For example, when integration of voice and data communications makes functional or financial sense, telephone operations are likely to join MIS. This union allows one group to manage changes in technology and customer service. Boundary disputes are eliminated by eliminating the boundaries.
- **Transition.** As one technology supplants another, the transition can be smooth if it is all contained under one roof. Facsimile devices have gone from being mail-room equipment to group or personal devices and eventually will become just another facet of personal computing. If one group such as MIS were to oversee this maturation of a technical application, change could be supported selectively or even encouraged. MIS can be a better agent for change if it has the full spectrum of responsibilities over an application area such as copiers.
- **Technical skills.** Even when no change in technology is contemplated, MIS can bring skills to an organizational marriage when other groups are using

technology that they have no tradition in handling. Word processing equipment is an example of technology that other groups tried to deploy. MIS not only can implement and maintain the hardware and software but can be more technically circumspect in selecting products. While MIS could perform a service and advisory role without organizational integration, keeping such activities all in the family is more efficient.

• **Management.** You know that we have come a long way when you cite our management skills as a reason to combine another group with MIS. Yet, we have also built considerable talents that would enhance any service operation. Over the years, MIS has developed a compulsion for reliable, quality service.

Service-level negotiation with users is a discipline that MIS pioneered. Cost/benefit analysis, vendor management and cost containment are all activities with which MIS has extensive experience. While our ability to communicate with top executives could stand improvement, it would still be a positive addition to many disenfranchised units in our companies. Even functions seemingly unrelated to MIS — such as copying facilities management, security and courier services — could benefit from the pure service management talents of MIS.

These strengths might make it sound as if MIS is the right organizational companion for everyone. Nothing is further from the truth. Organizational realignment with MIS must have compelling

reasons before redirecting precious MIS time and attention to it. Beware of and shun the stupid reasons for combining units, such as "no one else wants it" or "this will be organizationally convenient."

MIS cannot be a home for outcasts and misfits and still perform its primary mission. If we can offer improvements and a move makes sense, then we should aggressively assume new responsibilities. But MIS should heed the admonition of signs that once hung in army mess halls: "Take all you want, but eat all you take."

Young is managing director of MIS at the Wheeler Group, a division of Pitney Bowes, Inc. in Hartford, Conn.

Why give them mainframe "power" when you can give them a real mainframe?

Presenting Unisys Micro A. The mainframe small enough to make a big difference.



UN

About-face

CONTINUED FROM PAGE 87

make incremental progress anyway. "Automating the entire process probably is impossible, but you can get 50% of it very quickly, then 70%, then 90%, with not a lot of expense or risk," Young says.

The fundamental problem was that the bureau handled 20 million pieces of paper a year, Young says. Despite the inefficiencies, it was hard to wean the paper-handlers away from the paper.

What did the trick, the IRL director says, was to provide a small group of users with workstations and give them lots of special attention. Once the others were able to see the value of the new gadgets,

they wanted some, too.

Rather than an organizationwide mandate, "you need to get change agents out into that users group who will preach your philosophy," Young concludes.

Driven designer

Young also gives credit to IRL staff member Jack Floyd, who designed the computer system and was described as a man "driven to fix the export licensing process."

The result is the Export Control Automated Support System, an on-line system for licensing officers that runs on an IBM 3081. The bureau has also developed the following ancillary systems:

- The Electronic License Application and Information Network, which allows ex-

porters to submit their applications, and receive approved licenses via value-added networks.

- The Licensing Officer Access System, providing access to 15 million records on past and present applications to help them make faster and more consistent licensing decisions.

- A 32-station, local-area network for office automation applications.

- System for Tracking Export License Applications, or STELA, a computerized



MANUELLA PAGANELLI
Mercer

voice-response system that allows exporters to check on the status of their license using a Touch-Tone telephone. Exporters tap in the number of the application and hear a synthesized voice that states exactly where an application is in the process and how long it has been there.

STELA was a simple yet elegant response to a big political problem. Previously, exporters had so much trouble determining the status of their applications that they resorted to calling the man at the top, then-secretary Malcolm Baldrige, who in turn ordered his staff to find the answers.

Desperately seeking export

Baldrige reportedly got 20 calls a week from desperate exporters, Young says, recalling that former IBM Chairman John Opel called Baldrige every three weeks, and one executive chased Baldrige down during a European vacation.

STELA was one of the ideas in Young's 1984 automation plan that had stalled. "Lee Mercer got a lot of advice on STELA: 'Don't turn it on,' 'It's too early' and 'It's going to fail.' He looked at it, said it will work and gave the signal to go" in May 1986, Young says. STELA was operating in October of that year and has been very popular inside and outside of the agency, he adds.

Young says the STELA episode illustrates the importance of decisive action, fast timetables and top-management support.

"The best thing about it all is that the same people who were told three years ago that they didn't have the capacity to do the job — well, they did the job," Mercer concludes.

"I gave them a chance to implement their ideas, I helped with some guidance, and, where necessary, I threw some cross-body blocks to protect them," he says.

Tarkenton

CONTINUED FROM PAGE 87

Managers have to call a "play" and get developers to follow it, Abi says. "In developing a major system, people often go in different directions. They have to be part of the play. If they go in different directions, the project won't work."

Tarkenton says employees also need accountability, "some kind of a score-keeping system," as athletes have a score and statistics. Along with providing feedback, scorekeeping can make work more fun, he says.

Tarkenton says reinforcement should be systematic, timely and specific — as in a manager complementing a programmer on particular lines of code — and it should mix constructive criticism with a good deal of positive reinforcement. He promotes incentive-based compensation to get employees emotionally involved in work.

Taking risks is another key to success in business and football, Tarkenton says, noting that he also holds the NFL career record for throwing intercepted passes.

What about failure? Tarkenton's biggest one, in the view of some observers, is his failure to lead the Minnesota Vikings to a Super Bowl win in his three tries. He says that while the losses are a huge disappointment, he does not let them overwhelm him.

Chances are, some of the users in your organization could use the kind of power, versatility and global access a mainframe would offer.

But *simulating* that kind of capability with typical departmental systems can give you a spaghettiware solution that creates real problems.

So we created Micro A. The first, smallest, least expensive mainframe in the world that runs the same architecture as a broad, proven mainframe family.

Micro A is simply the smallest of 16 systems in the A Series ranging in size up through the A 17 (144 times more powerful, and one of the largest mainframes made anywhere).

With the same 48-bit architecture as the rest of the family, you'll never have to worry about the costs and productivity loss of software conversion.

You can easily extend your main computing system into department levels (without asking

anyone to give up their PC) and maintain a centrally controlled computing strategy. You'll simplify networking and have a single mainframe interface to manage.

See for yourself how this micro mainframe can make a big difference in your organization. *Call us for a free demonstration diskette*, more information or a live demonstration at 1-800-547-8362.

UNISYS AND YOU.
The power of ²

This is not a PC. It is a complete mainframe.

SPECIFICATIONS: Memory: 12 MB RAM
Users: up to 16 Disk Storage: 280 MB-1.4 GB

iSYS

THE STORAGE CONTROLLER



The Amdahl 6100 lets data move between storage devices and mainframes at maximum speed.

For years, most systems have had a huge bottleneck in the worst possible place. Halfway between the storage devices and the CPU. Because a typical storage controller can't begin to handle the traffic. In fact, most of the time, it limits you to only four I/O paths. And channel utilization of 35% or less.

But now, there's a way to eliminate those bottlenecks permanently. The Amdahl 6100 Storage Processor. It gives your system four times the throughput. And twice the capacity.

An intelligent approach.

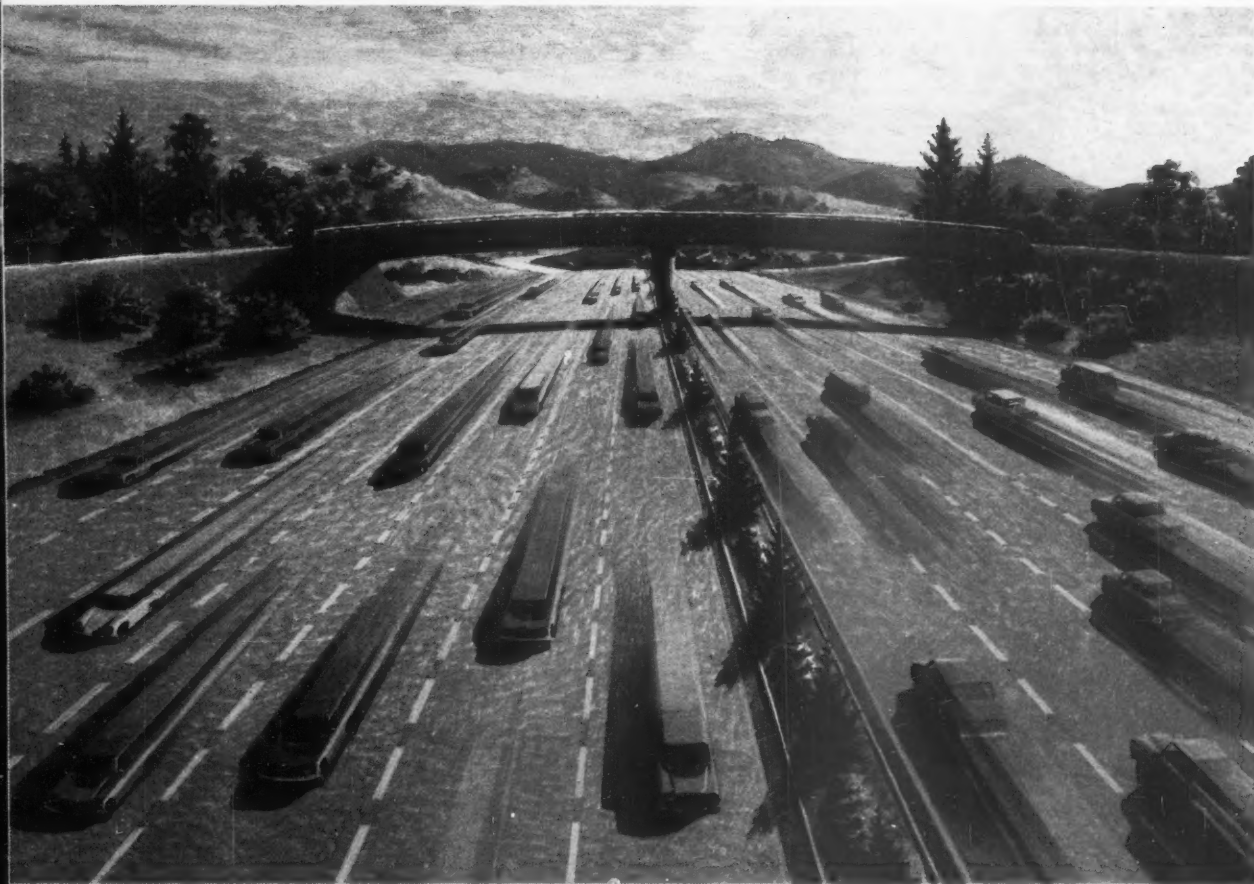
Instead of blocking traffic, the Amdahl 6100 actually helps it move much faster. At speeds up to 72 MB/second. Because it has the intelligence to control the flow of data on 16 concurrent I/O paths.

As a result, you can build a much more sophisticated storage subsystem. With 240 GB capacity, 32 CPU attachments, 512 MB shared storage, and 16 MB nonvolatile storage.

Yesterday's limits are history.

In the past, the only way to keep access times down was to underutilize some of the most expensive components of your system: DASD space, channels, and controllers. But with data moving along 16 I/O paths, you can use much more of these valuable resources. Without slowing down a bit.

VS. THE STORAGE PROCESSOR.



The old limits on cache are gone, too. With the Amdahl 6100, you get up to 512 MB. But instead of being divided into rigid compartments, our cache is totally flexible. It dynamically adjusts to the environment as you go. No matter how much the workload changes, you don't have to tune across DASD strings trying to keep up.

The faster you go, the less it costs.

When you think about it, this is the most impressive fact of all. Almost 50% of your total hardware budget goes for storage. And in today's systems, you have to look at storage as necessary overhead.

But if you install a 6100 now, it can become an integral part of a balanced system. Reduce the load on your CPUs. Raise your productivity. And lower your overall cost of computing.

In all, this is such a fundamental change in the balance between CPUs and storage devices that it creates the first real system of the '90s. With all its power and capacity, the 6100 lets you grow well into the next decade. And its processor design makes it easy to add new functional and performance enhancements as they're introduced.

So if you'd rather not let a conventional storage controller slow you down, call your Amdahl representative. And we'll help you move into the fast lane.

amdahl
The Intelligent Choice

Amdahl Corporation
1250 East Arques Avenue
Sunnyvale, CA 94089-3470

MANAGEMENT BRIEFS

Industry standouts garner gold

Steele, Bradshaw, DeFanti to receive ACM awards at annual conference

The Association for Computing Machinery (ACM) last week identified the award winners who will be honored at the annual ACM Computer Science Conference in Louisville, Ky., February 21-23.

Guy L. Steele, senior scientist at Thinking Machines Corp., was named recipient of the ACM Grace Murray Hopper Award, which was established in 1971 to recognize persons who have made outstanding technical contributions to the computer industry while 30 years of age or younger.

Steele will be honored for his general contributions to the development of higher order symbolic programming, principally his advancement of lexical scoping in LISP.

The ACM also announced that Charles L. Bradshaw, chairman of the computer science department at Mississippi State University, will receive the ACM Distinguished Service Award. Bradshaw will be honored for his 35 years of contributions to the government, educa-

tional and professional computing community. Prior to joining Mississippi State, Bradshaw was active in computing at Oak Ridge National Laboratory, the National Aeronautics and Space Administration Marshall Space Flight Center and Vanderbilt University.

Thomas A. DeFanti, director of the electronic visualization laboratory at the University of Illinois at Chicago, will receive the ACM Outstanding Contribution Award. DeFanti was cited for originating the *ACM Singsong Video Review* and for his impact on teaching computer graphics.

Citing the growing importance of electronic data interchange (EDI), the Association for Systems Management recently added an EDI-related offering, "Principles of EDI: A guide to the Potential of a Future Competitive Necessity," to its course schedule. The two-day course will be offered throughout the U.S. and was designed to provide nontechnically oriented

business people with an understanding of EDI.

A users group for devotees of the "information engineering" methodology for systems development was formed early this month by James Martin Associates, Inc. in Reston, Va. The **Information Engineering Users' Group** was created for corporate information executives who use supporting computer-aided software engineering tools and information engineering techniques.

The first meeting was held last week in Teaneck, N.J., and featured a presentation by SeaLand Corp. in Elizabeth, N.J., on its experiences with the information engineering process. For information, call William Sheleg at 201-326-9558.

The recently formed **International DB2 Users Group** has announced its board of directors. The group named William Backs from Scott, Foresman and Co. in Glenview, Ill., as president.

CALENDAR

JAN. 22-28

Conference On Network Management. San Diego, Jan. 23-25 — Contact: Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

Document Processing and Optical Disk Systems Conference. Phoenix, Jan. 23-25 — Contact: CAP International, One Longwater Circle, Norwell, Mass. 02061.

Seminar on IBM and the New Open Market. Denver, Jan. 23-25 — Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

Middle East Electronic Communications Show. Manama, Bahrain, Jan. 23-26 — Contact: Kallman Associates, Five Maple Court, Ridgewood, N.J. 07450.

Conference on Improving Productivity in EDP System Development. Phoenix, Jan. 23-27 — Contact: Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

Improving Productivity in EDP System Development. Phoenix, Jan. 23-27 — Contact: Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

Computers and Reading/Learning Difficulties Conference. San Francisco, Jan. 26-28 — Contact: Educational Computer Conferences, 1070 Crows Nest Way, Richmond, Calif. 94803.

JAN. 29-FEB. 4

Image Scanning and Processing Conference. Monterey, Calif., Jan. 29-31 — Contact: Institute for Graphic Communication, 77 Rumford Ave., Waltham, Mass. 02154.

Seminar on IBM's Systems Application Architecture. Santa Clara, Calif., Jan. 30-31 — Contact: Gen2 Ventures, Suite D5, 12930 Saratoga Ave., Saratoga, Calif. 95070.

Preventing and Containing Computer Virus Attacks. Arlington, Va., Jan. 30-31 — Contact: United Communications Group, Suite 700N, 4550 Montgomery Ave., Bethesda, Md. 20814.

Unix Technical Conference. San Diego, Jan. 30-Feb. 3 — Contact: Usenix Association Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

DB/Expo '89. San Francisco, Jan. 31-Feb. 2 — Contact: NDN Enterprises, No. 204, 289 S. San Antonio Road, Los Altos, Calif. 94022.

Infocomm International Trade Show for Telecommunications Products. Dallas, Feb. 2-4 — Contact: The International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

Automating International Trade Transactions Forum. Santa Clara, Calif., Feb. 2 — Contact: NCITD-The International Trade Facilitation Council, Suite 205, 350 Broadway, New York, N.Y. 10013.

SNA DECnet

WHEN THEY GET ALONG, YOU'VE GOT IT MADE!

When your SNA networks communicate with your DECnet™ networks, your whole enterprise benefits. Interlink's Software Network Solution/ SNA Gateway™ (SNS/SNA Gateway™) family is your connectivity solution for SNA and DECnet.

The SNS/SNA Gateway family permits your SNA corporate communications backbone to be a vehicle for DECnet connectivity. With it, DECnet networks can route communications to each other over the IBM SNA network. And systems in a SNA network can participate in a DECnet network. With

the SNS/SNA Gateway family, information goes both ways.

In addition to SNA routing, the SNS/SNA Gateway family includes an APPC/LU6.2 programmer's interface. It allows you to develop common application programs using IBM's strategic program-to-program interface. You save time and money by developing transportable applications between IBM and DEC.

Need to centralize your network management? Our NetView interface lets you do just that. Through NetView and over SNA. With one network man-

agement environment you can better control your network resources whether they reside on the SNA network or connected DECnet networks.

Increased network communications at all levels, efficient use of computing resources, and time-saving information transfer are some of the benefits of other SNS Gateway family functions.

By minimizing duplication and combining the inherent strengths of each network, Interlink's SNS/SNA Gateway allows enterprises to capitalize on the capabilities of its people and computers.

For your free SNS product catalog, call (800) 422-3711 or (415) 657-9800. Or write the address below.

When SNA and DECnet get along, you've got it made.



INTERLINK
Computer Sciences

47370 Fremont Boulevard
Fremont, California 94538

Trademarks: SNS/SNA Gateway is a trademark of Interlink Computer Sciences, Inc. APPC/LU6.2, NetView, and RSCS/NJE are trademarks of International Business Machines Corp. IBM is a registered trademark of International Business Machines Corp. DECnet is a trademark of Digital Equipment Corp.

COMPUTER INDUSTRY

INDUSTRY INSIGHT

Clinton Wilder

Bye, bye to American pie?



U.S. computer vendors plotting their strategies for the unified European market in 1992 had better not ignore what the European vendors are doing on this side of the Atlantic.

Two weeks ago, National Semiconductor sold 50% of its ownership in National Advanced Systems to Memorex Telex — a firm that grew up in the U.S. but now has the curious hybrid of Italian top management, Dutch incorporation and a British corporate headquarters. Despite the obvious point that we're talking about CPUs made by Hitachi, the deal had the very familiar ring of recent actions by two other U.S. mainframe makers — Honeywell and IBM.

Honeywell is now down to a less than 20% interest in the computer business. It gives every indication that it is thinking the sooner it can get out completely and turn the business over to France's Bull, the better.

IBM, while strongly insisting

Continued on page 97

Strife hits industry in fourth quarter

BY NELL MARGOLIS
CW STAFF

Intense competition and increasingly demanding and sophisticated users have combined to create an era of intolerance in the computer industry — and companies from venerable NCR Corp. to entrepreneurial Apple Computer, Inc. are paying the price.

Traditionally one of the industry's reliable slow and steady gainers, NCR attributed its fourth-quarter stumble to declining domestic orders. Moreover, the firm cautioned that falloff in second- and third-quarter year-to-year orders bodes badly for overall growth prospects in the first half of 1989.

Domestic sluggishness did indeed impact NCR, said William Easterbrook, an analyst at Kidder, Peabody & Co. To that extent, he said, the bad news is extrapolative: Substellar U.S. performance was a recurring refrain in computer company earnings reports for the December quarter.

However, Easterbrook added, "NCR's orders were soft because they haven't had any blockbuster products in the past six months, and the new products they had, they got out late."

Apple got an object lesson in the meaning of market intolerance when its fourth-quarter

numbers, while impressive, showed a slip in profit margins. The shortage-induced high cost of dynamic random-access memory, said Steven Ossad, an analyst at County Natwest Securities USA, contributed to the slight shift in gross margins. More significant, Ossad said, were price increases instituted by Apple last autumn. "That was the real culprit," he said. "The prices were so high that buyers moved to less-rich configurations."

Cutbacks hurt, not help

Hoping to tempt customers back, Apple last week cut some of the earlier increases and decreased the prices of certain add-ons for the affected Macintosh computers. Far from being reassured, "Everyone apparently focused on the price cuts and saw them as indicating a slowdown in demand for the Macintosh line," noted David Soetebier, an analyst at A. G. Edwards & Sons. Immediately following the announcement of the earnings report and news of the price rollbacks, Apple stock plummeted 3.38 points.

"They got shellacked," Ossad said, calling Apple a strong company "still achieving staggering gains." Other analysts agreed.

Diminishing sales of older products and production delays

1988 fourth-quarter earnings

Wang wanes, Tandem gains, and Maxtor enters an era of "profitless prosperity"

	Revenue October through December (in millions)	Percent change from 1987	Net income October through December (in millions)	Percent change from 1987
Advanced Micro Devices	\$248.1	(6%) ¹	(\$34.1)	— ²
Automatic Data Processing	\$409.5	9%	\$44	10%
Apple	\$1.4B	35%	\$140.5	16%
Intel	\$727.3	27%	\$85.8	(10%)
Intellicorp	\$5.1	3%	\$0.01	— ³
Maxtor	\$91.4	23%	\$0.8	(85%)
NCR	\$1.8B	(1%)	\$149.6	(7%)
Network Equipment Technologies	\$35.5 ⁴	43%	\$4.2	24%
Phoenix Technologies	\$14.6	67%	\$2.9	100%
Seagate Technology	\$340.3	2%	\$7.6	(67%)
Software Publishing	\$23.2	65%	\$3.8	50%
Tandem	\$392.3	39%	\$31.3	32%
Tandy	\$1.4B	8%	\$135.1	3%
Wang	\$760.7	(3%)	\$1	(97%)

¹ Parentheses indicate decrease or loss

² Quarterly loss includes unusual charge of \$17.3 million associated with work force reduction of approximately 2,400 positions worldwide

³ Reported loss of \$972,000 in 1987

⁴ Income increase computed before an extraordinary credit

CW CHART: JOHN YORK

in the new VS 5000 line handed Wang Laboratories, Inc. — and Wall Street — a shocker: earnings down 97% in the December quarter. However, said Jeff Gorman, an analyst at Soundview Financial Group in Stamford, Conn., "People are more focused on futures with Wang."

Orders for the delayed VS 5000 are strong, according to the company, which also said that it already has booked 68 orders for a high-end minicomputer scheduled for announcement

this week.

Fault-intolerant users, on the other hand, delivered a strong quarter to the company that delivered hotly demanded fault-tolerant products to them. Tandem Computers, Inc. turned in an impressive fourth-quarter performance, flouting several industry clichés in the process. In a period marked by sagging U.S. sales, Tandem logged its second consecutive quarter of year-to-year growth in its domestic com-

Continued on page 97

Ex-Unisys exec joins Northern Telecom

BY NELL MARGOLIS
CW STAFF

MISSISSAUGA, Ontario — When it comes to careers in multinational companies, former Unisys Corp. President Paul G. Stern literally wrote the book: Still untitled, it will be published by Warner Books, Inc. Now the 50-year-old veteran executive is about to add a new chapter.

Effective March 1, he will become chief executive officer of communications giant Northern Telecom, Inc. Stern, who has been serving Northern Telecom as a board member and consultant since last spring, will take on the firm's chairmanship upon current Chairman Edmund Fitzgerald's planned retirement

in April 1990.

How will the new head of Northern Telecom proceed? "Very carefully and very



Paul G. Stern

fast," he said in an interview last week.

Borrowing a phrase from President George Bush, on

whose campaign finance committee he recently served, Stern said that he intends to stay the course already set for the \$4.9 billion firm, making sure that planned new products are well positioned in an increasingly global market.

Stern's previous corporate stops, before joining the computer industry with former Burroughs Corp., included Du Pont Co., Rockwell International Corp. and Gillette Co.

Stern has also been around Washington, D.C. — another experience he expects to turn to his new company's benefit. With respect to both commercial products and defense contracting, he said, "I know how to deal with bids, get export licenses, things like that."

Ax falls at National Semi

Long-predicted down cycle in chip market kicks in

BY J. A. SAVAGE
CW STAFF

The chips are falling in price and profit margins — and so are 2,000 employees at National Semiconductor Corp.

National Semi announced last week that it will lay off 2,000 employees worldwide, or 5% of its labor force. This follows a lay-off of 450 in August in its Data-checker Systems, Inc. and National Advanced Systems (NAS) subsidiaries.

Other U.S. chip giants Intel Corp. and Advanced Micro Devices, Inc. (AMD) reported weaker financial results last week, showing evidence that the long-predicted down cycle in the semiconductor industry is at hand.

Although sales may be grow-

ing, lower per-unit prices are pressuring National Semi and the industry in general to shrink operations, according to Millard Phelps, an analyst at Hambrecht & Quist, Inc.

"I expect [National Semi] to save between \$32 million and \$36 million in expenses by the end of its fiscal year," which is March 30, Phelps said.

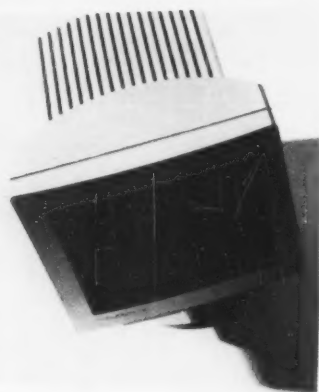
Cash infusion needed

The layoffs and an infusion of cash from the recent sale of its retail systems company, Data-checker, for \$90 million and the sale of half of its mainframe company, NAS, for \$250 million to Memorex Telex N.V. should help National Semi's bottom line.

In the last two quarters, the

Continued on page 96

We make a super VGA monitor



NEC introduces the best VGA monitor you can
buy. MultiSync® 2A.

The first monitor that takes our award-win-
ning multiple frequency technology and cus-
tomizes it to the needs of the VGA user.

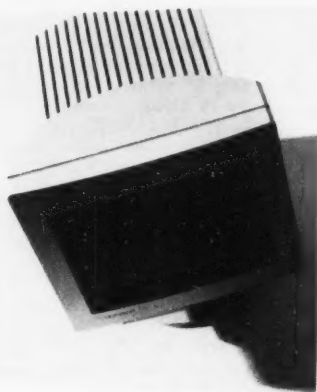
MultiSync 2A is both affordable and uncompromised. And
completely compatible with all VGA modes. In short, it performs
brilliantly. But what's equally important, it allows you to move
effortlessly to the next major graphics standard: SuperVGA.

All this in a monitor that gives you a 14" non-glare screen on
a tilt-swivel base, for nearly 30% more viewing area than stan-
dard 12" screens, and a new cabinet that's not only functional but is
designed to look as good from the back as it does from the front.

MultiSync 2A. One super VGA monitor.

VGA model shown at \$229.95Computers and Communications

that's also a SuperVGA monitor.



But that's only part of the story. NEC also introduces the best SuperVGA monitor you can buy. MultiSync® 2A.

The first monitor that takes our award-winning multiple frequency technology and customizes it to the needs of the SuperVGA user. MultiSync 2A senses the software you're using and makes the switch from a VGA monitor to SuperVGA, the new standard developed by NEC and recognized by VESA, the Video Electronics Standards Association. SuperVGA delivers a maximum resolution of 800 x 600, which is 56% higher than VGA.

And since you're most likely buying a board that goes beyond VGA, your monitor should too. For literature call 1-800-826-2255. For technical details call NEC Home Electronics (USA) Inc. at 1-800-FONE-NEC.

MultiSync is a registered trademark of NEC Home Electronics (USA) Inc.

MultiSync 2A. One SuperVGA monitor.

© 1989 NEC Home Electronics (USA) Inc.

NEC

National Semi

CONTINUED FROM PAGE 93

firm reported a net loss of \$55.7 million.

Despite the massive work force reduction, all 22 National Semi facilities worldwide will remain open, according to a company spokeswoman.

AMD reported a 5% drop in fourth-quarter sales that contributed to a \$34.1 million loss. The loss included a one-time charge of \$17.3 million for the Sunnyvale, Calif., firm's restructuring, which included the previously announced layoff of 2,400 employees.

AMD still managed to post a profit of \$19.3 million for the year, a dramatic turnaround from a \$64 million loss in

ALTHOUGH SALES may be growing, lower per-unit prices are pressuring National Semi and the industry in general to shrink operations.

1987. After the acquisition of Monolithic Memories, Inc., AMD reported sales of \$1.13 billion, up 13% from 1987.

Like AMD, Intel saw a strong year slow down dramatically in the fourth quarter. In Intel's case, however, it was a matter of stockpiled supply exceeding demand for the 80386 microprocessor, which battered profit margins.

Despite a 27% sales increase to \$727 million, Intel's fourth-quarter earnings fell 10% to \$86 million. For the year,

profits, fueled by strong demand for the single-sourced 80386 early in the year, still grew 83% to \$453 million on revenue of \$2.9 billion, up 51% from 1987.

Bucking the trend of the larger suppliers was Chips and Technologies, Inc., whose healthy growth continued in the second fiscal quarter ended Dec. 31. Earnings jumped 41% to \$7.9 million on revenue growth of 68% to \$54.4 million.

Senior Editor Clinton Wilder contributed to this report.

You can discover the world of communications-FREE with this ticket.

At Communication Networks' unique Exposition, you'll see over 350 of the industry's leading exhibitors displaying products, systems, software and services in key areas such as: satellite communications, PBX and telephone systems, fiber optics, LANs and network management and control. All under one roof. You'll get the information you need to connect your organization with the world business community for maximum operating efficiency and productivity.

What's more, CN '89 has been selected by the U.S. Department of Commerce to participate in its elite Foreign Buyer Program. So you'll be able to meet decision makers from around the world with similar goals, responsibilities and priorities.

And while you're there, you can also participate in the CN Conference Program. During three intensive days, you'll have the opportunity to explore the entire world of voice, data and telecommunications technology, applications and policy through 18 in-depth tutorials and 80 conference sessions.

For more information about the Conference Program and fees, call toll-free 1-800-225-4698 or 508-879-6700, Ext. 646.

FOR FREE ADMISSION TO EXHIBITS: Take this ticket to the Registration Area to discover the world of communications and save \$20.

Exhibitor list as of 11/25/88.



**COMMUNICATIONS NETWORKS '89
EXPOSITION TICKET**

Answering the challenge in a changing world.

Washington, D.C. Convention Center
900 Ninth Street, N.W.
Washington, D.C. 20001
February 6-8, 1989

CW

COMMUNICATION NETWORKS CONFERENCE & EXPOSITION

Answering the challenge in a changing world.

Washington, D.C. February 6-8, 1989

Communication Networks is produced by IDG Conference Management Group, an International Data Group company, 20 Speen Street, Framingham, MA 01701.

ADMIT ONE FREE
(A \$20 VALUE)

Good for admission to Expo only (no one under 18 years of age admitted).

COME EARLY AND SEE EVERYTHING.

Exposition Hours: Mon., Feb. 6, 9:30 a.m. - 6:30 p.m.
Tue., Feb. 7, 8:30 a.m. - 6:30 p.m.
Wed., Feb. 8, 8:30 a.m. - 12:00 p.m.

Registration Hours: Sun., Feb. 5, 1:00 p.m. - 6:00 p.m.
Mon., Feb. 6, 6:30 a.m. - 6:00 p.m.
Tue., Feb. 7, 6:30 a.m. - 6:00 p.m.
Wed., Feb. 8, 6:30 a.m. - 11:00 a.m.

IN BRIEF

Atherton snatches Goldberg

Computer-aided software engineering startup Atherton Technology in Sunnyvale, Calif., has snagged 24-year IBM veteran Arthur G. Goldberg as its president and chief executive officer. Goldberg, 45, was most recently director of business development at IBM's AIX Systems Project Office. Before his tenure in that department, he was director of workstation systems in the Entry Systems Division. Goldberg is considered to have been a key force behind the recent comeback of IBM's RT workstation.

Unisys to sell Convex CPU

Convex Computer Corp. has discovered a new distribution channel — Unisys Corp. — in Brazil. In a multiyear agreement, Unisys' Brazilian subsidiary agreed to sell and service Convex minisupers in Brazil. The agreement marks Convex's entry into the Latin American market.

Perot gets active again

H. Ross Perot, whose Perot Systems Corp. has been quiet of late, has himself been active on the investment front. Archive Corp., a Costa Mesa, Calif.-based manufacturer of 1/4-in. cartridge tape drives, confirmed last week that Perot, through a private investment group, has agreed to fund technology development at Archive in exchange for rights to purchase approximately one million shares of Archive stock. The actual amount of the Perot investment was not disclosed; Archive stock was trading at roughly \$8 per share last week.

Unix consolidation

There will be consolidation in the growing niche of Unix systems software with the forthcoming acquisition of Taskforce Software Corp. by AIM Technology for an undisclosed amount. Santa Clara, Calif.-based AIM Technology specializes in Unix performance measurement and management software.

It's official now

Oracle Corp. and AT&T have formalized the sale of Oracle software on AT&T computer systems with an OEM agreement announced last week. AT&T sales representatives will sell Oracle products with AT&T's entire hardware line. Oracle currently holds similar agreements with other systems manufacturers.



Reading someone else's copy of Computerworld?

YES, I want to receive my own copy of COMPUTERWORLD. Please send me 51 weekly issues for only \$39.00* — just 76¢ per copy. In addition, I'll receive FREE bonus issues of COMPUTERWORLD FOCUS.

First Name _____	MI _____	Last Name _____
Title _____		Company _____
Address _____		
City _____	State _____	Zip _____

Address Shown: ☐ Home ☐ Business

Basic Rate: \$48

* U.S. Only. Canada \$110, Central/South America \$135, Europe \$195 (Airmail), all other countries \$295 (Airmail). Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD



Reading someone else's copy of Computerworld?

YES, I want to receive my own copy of COMPUTERWORLD. Please send me 51 weekly issues for only \$39.00* — just 76¢ per copy. In addition, I'll receive FREE bonus issues of COMPUTERWORLD FOCUS.

First Name _____	MI _____	Last Name _____
Title _____		Company _____
Address _____		
City _____	State _____	Zip _____

Address Shown: ☐ Home ☐ Business

Basic Rate: \$48

* U.S. Only. Canada \$110, Central/South America \$135, Europe \$195 (Airmail), all other countries \$295 (Airmail). Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. BUSINESS/INDUSTRY (Circle one)
 10. Manufacturer (other than computer)
 20. Finance/Insurance/Real Estate
 30. Medicine/Law/Education
 40. Wholesale/Retail/Trade
 50. Business Service (except DP)
 60. Government — State/Federal/Local
 65. Communications Systems/Public Utilities/Transportation
 70. Mining/Construction/Petroleum/Refining/Agric.
 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
 90. Computer/Peripheral Dealer/Distributor/Retailer
 95. User/Other _____
 99. Vendor/Other _____ (Please specify)
2. TITLE/FUNCTION (Circle one)
 10. Vice President, Asst. VP
 21. Dr., Mgr., Suprv., IS/MS/DP Services
 22. Dr., Mgr., Suprv., of Operations, Planning, Adm. Services
 23. Dr., Mgr., Suprv., Analyst, of Systems
 31. Dr., Mgr., Suprv., of Programming
 32. Programmer, Methods Analyst
 35. Dr., Mgr., Suprv., QA/QP
 38. Data Comm., Network/Systems Mgt.
 - OTHER COMPANY MANAGEMENT
 11. President, Owner/Partner, General Mgr.
 12. Vice President/Asst. VP
 13. Treasurer, Controller, Financial Officer
 41. Engineering, Scientific, R&D, Tech. Mgt.
 51. Sales/Mktg. Mgt.
 - OTHER PROFESSIONALS
 60. Consulting Mgt.
 70. Medical, Legal, Accounting Mgt.
 80. Educators, Journalists, Librarians, Students
 90. Others _____ (Please specify)
3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.
 - A. Mainframes/Supremas
 - B. Minicomputers/Small Business Computers
 - C. Microcomputers/Desktops
 - D. Communications Systems
 - E. Office Automation Systems
 - F. No Computer Involvement

E4904-5

1. BUSINESS/INDUSTRY (Circle one)
 10. Manufacturer (other than computer)
 20. Finance/Insurance/Real Estate
 30. Medicine/Law/Education
 40. Wholesale/Retail/Trade
 50. Business Service (except DP)
 60. Government — State/Federal/Local
 65. Communications Systems/Public Utilities/Transportation
 70. Mining/Construction/Petroleum/Refining/Agric.
 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
 90. Computer/Peripheral Dealer/Distributor/Retailer
 95. User/Other _____
 99. Vendor/Other _____ (Please specify)
2. TITLE/FUNCTION (Circle one)
 10. Vice President, Asst. VP
 21. Dr., Mgr., Suprv., IS/MS/DP Services
 22. Dr., Mgr., Suprv., of Operations, Planning, Adm. Services
 23. Dr., Mgr., Suprv., Analyst, of Systems
 31. Dr., Mgr., Suprv., of Programming
 32. Programmer, Methods Analyst
 35. Dr., Mgr., Suprv., QA/QP
 38. Data Comm., Network/Systems Mgt.
 - OTHER COMPANY MANAGEMENT
 11. President, Owner/Partner, General Mgr.
 12. Vice President/Asst. VP
 13. Treasurer, Controller, Financial Officer
 41. Engineering, Scientific, R&D, Tech. Mgt.
 51. Sales/Mktg. Mgt.
 - OTHER PROFESSIONALS
 60. Consulting Mgt.
 70. Medical, Legal, Accounting Mgt.
 80. Educators, Journalists, Librarians, Students
 90. Others _____ (Please specify)
3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.
 - A. Mainframes/Supremas
 - B. Minicomputers/Small Business Computers
 - C. Microcomputers/Desktops
 - D. Communications Systems
 - E. Office Automation Systems
 - F. No Computer Involvement

E4904-5



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD



P.O. Box 2044
Marion, Ohio 43306-2144



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD



P.O. Box 2044
Marion, Ohio 43306-2144



Wilder

CONTINUED FROM PAGE 93

ing that its recent Rolm move will only strengthen its position in the U.S. private branch exchange (PBX) business, prefers to share that business 50-50 with West Germany's Siemens.

Clearly, the Japanese are not the only ones willing to invest big money for equity stakes in U.S. computer firms. Western Europe's high-technology giants have definitely been on the prowl in the New World recently. Another example is UK giant STC, parent of British mainframer ICL, which picked up both Computer Consoles and National Semiconductor's Datachecker point-of-sale business in acquisitions announced last month.

sitions announced last month.

Most of these deals match businesses that haven't turned out as their U.S. parents had hoped with Europeans willing to ante up for the invaluable U.S. computer industry beachhead. In terms of perceived value, an American's drain on the bottom line is a European's golden opportunity to establish or expand its presence in the world's largest computer market.

For the European firms, the message that comes through for '92 is loud and clear — get big and get global. And no one can claim to be global without proof that it can sell West German PBXs in Frankfurt, Ky., or French minicomputers in Paris, Texas.

The computer industry is hardly

alone. In all industries, *Mergers & Acquisitions* magazine recently reported that Europeans spent \$32.9 billion on 280 U.S. acquisitions last year, compared to only \$3.6 billion worth of European acquisitions by U.S. companies. In 1987, the deficit was even more dramatic: \$37.1 billion from European buyers vs. \$2.4 billion from U.S. acquirers.

Is anyone concerned about this trend? Yes. Two weeks ago, a unit of the Sematech chip industry consortium urged a federal panel to block the sale of Monsanto Electronics Materials, the last major independent U.S. silicon wafer producer, to a West German buyer.

In that industry, with a Japanese market share of 65%, the concern is the U.S. giving up its share of what is left of the

pie to the Europeans.

The implications of massive Japanese investment in the U.S. have been well documented — so much so that it was one of the few substantive issues to receive lip service in the U.S. presidential campaign. But there are competitors across the other ocean who have a very strong motivation to expand quickly in the next three years.

That means plenty of opportunities for U.S. vendors to realize short-term capital boosts thanks to European money. But they should also consider the long-term competitive implications — and so should their customers.

Wilder is *Computerworld*'s senior editor, computer industry.

Strife hits

CONTINUED FROM PAGE 93

puter business, according to President James Treybig.

While some companies have complained of corporate indigestion following large acquisitions, Tandem announced that recent acquiree Ungermann-Bass, Inc. exceeded its expectations.

Magic? Hardly. Tandem's secret, Governor said, is simple: give the people what they want.

"Tandem is in a high-growth area: OLTP for mission-critical systems," Governor said. "When Tandem talks to a customer, they go in talking OLTP and fault-tolerance, not 'look at our whizz-bang technology.' They sell the area, not the machine."

Timely supply to a demanding market also boosted Norwood, Mass.-based Phoenix Technologies Ltd. into a strong quarter. In a prepared statement, Chief Executive Officer Neil Colvin attributed the company's 100% profit surge and 67% rise in revenue to continued strength in sales of IBM Personal Computer compatibles and returns from Phoenix's line of system software products geared to the booming workstation and peripherals markets.

Expected price erosion in the company's ST-506 and 380M-byte enhanced small device interface and small computer systems interface product lines set off an earnings dive-bomb at San Jose, Calif.-based disk drive vendor Maxtor Corp. This fall offset a more than respectable revenue rise and prompted the company to predict shrinking gross margins and depressed earnings potential in the near-term. In a phrase worthy of first-ballot entry into the oxymoron hall of fame, CEO George Scalise declared that Maxtor is "in a period of profitless prosperity."

Oxymoronic but accurate, County Natwest's Ossad said: Despite the earnings debacle, Maxtor "is still the best-positioned disk drive company in the industry. Their balance sheet is improved, they've shown very rapid growth in new products and they made money."

"The computer industry is in transition, and it isn't clear where the transition is leading," said Martin Rensinger, an analyst at Duff & Phelps, Inc. The one sure bet is there are no sure bets any more, he said. "Not only does a company have to have new products and get them out on time, it also has to guess right with regard to what the customer's going to want by time the company does get them out. That can be the hardest part."



**Computerworld
PERSPECTIVES
1989**

The Annual Executive Conference for Strategic Information Management

June 20-21, 1989 Marriott Marquis
New York City

Computerworld PERSPECTIVES 1989 is the only senior-level conference in the industry dealing with your most important business challenge: How to use information systems to maximize competitive advantage.

Computerworld PERSPECTIVES 1989 is designed exclusively for senior corporate MIS users.

Working with peers and experts in your field, **Computerworld PERSPECTIVES 1989** is a unique

opportunity to examine your most pressing IS problems.

In 18 breakout sessions and six work-group seminars, you will interact with world-class keynotes and speakers.

Computerworld PERSPECTIVES 1989 offers a customized program designed to best meet your needs. You can pursue a single theme or mix and match sessions based on your interests. The three conference themes are:

- *Buying Smart: Pacing Your Information Systems Portfolio*
- *Winning Strategies: Information Systems and the New Corporation*
- *Mandates for Change: Information Systems in the 1990s*

Computerworld PERSPECTIVES 1989 is an intensive two-day conference probing the strategic options, advantages and risks involved in successfully building your information-based organization. You must register no later than March 14. For more information, just attach your business card to the coupon below, or call (212)246-0984.

If you can only go to one conference this year, attend Computerworld PERSPECTIVES 1989.



YES, I want to learn more about **Computerworld PERSPECTIVES 1989** before March 10. I've attached my business card.

Mail to:

Computerworld PERSPECTIVES 1989
c/o Carter Communications
211 West 56th Street, Suite 31-A
New York, New York 10019

Or call (212)246-0984 and ask to speak with Carter Prescott.

COMPUTER CAREERS

Consultants walk a rough road

Many independent operators falter after the initial assignment

BY ALAN RADDING
SPECIAL TO CW



For MIS professionals confronted with the constraints and uncertainties of corporate consolidations, independent consulting can present an inviting alternative.

In fact, the corporate restructuring is creating a growing demand for consultants, says Craig Bickel, a managing associate at consulting firm Index Group, Inc. in Cambridge, Mass. As firms slim down by reducing in-house staff, they bring in more consultants, Bickel says. "People are being driven into the [consulting] market just when the same forces are creating consulting opportunities."

However, the road to success as an independent consultant is strewn with pitfalls.

High turnover

There is no exact figure on the survival rate for independent computer consultants, but the Independent Computer Consultants Association (ICCA) in St. Louis reports a 25% annual turnover in membership, even though the group continues to grow. Most of the turnover is attributed to members leaving the

computer consulting business, according to Jack Christensen, executive director of the ICCA.

"Most people start consulting with their first job already lined up, but then they complete the job and it ends," explains Gene Sutton, a consultant since 1976 and president of the Greater Boston chapter of the ICCA.

Once the initial assignment is over, the new consultant has to market himself, hustling to get the next job. "At that point, they fall out pretty quickly," Sutton says. He estimates that as few as 25% of new consultants make it past start-up and sustain an ongoing operation.

Christensen warns that success in independent consulting takes time. "If someone is looking at consulting as an interim thing, he shouldn't be doing it," he says. Successful consulting demands a psychological commitment, he adds. Otherwise, suddenly being on your own without a steady paycheck can be overwhelming.

Last year was a hard one for Seth Metzger from Duxbury, Mass., who turned to independent consulting after working in corporate MIS and then at a computer vendor. After contemplating the move for several years, Metzger was finally pushed into it when the vendor went bankrupt, presenting him

with the opportunity to take on some of its customers.

But after completing his first assignments, Metzger, who specializes in systems integration and writing mainframe applications, found others were not immediately forthcoming and contemplated dropping consulting.

SOME CONSULTANTS earn handsome salaries, but most of the ones who hang on make the equivalent of or slightly more than their pay in the corporate world, consultants say.

But the picture improved as some proposals eventually brought in business, and he decided to stay with it. "I discovered that it takes longer than you think," says Metzger, who still relies on brokers between work with his own clients.

Alex Krazesky from Cambridge, Mass., has been a consultant during the past five years but still has not reached a level of stability. "I don't really feel I've arrived. It is always a hassle finding work," he says. After 15 years of bouncing from job to job in the MIS world, often as the result of an outspoken nature that did not suit a prevailing corporate culture, he decided that he

might as well be independent.

Krazesky, who takes on mainframe database or telecommunications assignments, also contracts directly with clients but turns to brokers when business is slack. "If I have nothing lined up, I may call five or six agencies and tell them I have time available," he says.

Dave Cassell, a computer consultant broker in Houston and president of the National Association of Computer Consultant Businesses, says someone

and benefits that employers usually pick up, such as health insurance and paid vacations.

Brokers take commissions of as much as 30% of the consultant's fee, although the details of the arrangement are negotiable. A 1986 addition to the federal income tax code, Section 1706, limits the extent to which independent contractors can rely on a broker for regular assignments.

Stable and able

One consultant who has reached the point of stability is Morris Segal, a partner in Systems Consulting Professionals (SCP) in Alexandria Va., which assists systems integrators with chores from drafting proposals to coding. With three other partners, Segal formed SCP four years ago after the group spent two years developing the business part-time while working for a computer vendor.

Unlike most consulting businesses, SCP was successful from the start and has never had trouble sustaining itself. "We haven't had slack periods. We never advertised, and we don't do much selling," Segal says. He attributes the success to the part-time preparation and the experience of the four computer industry veterans with both vendors and MIS organizations.

The group's contacts brought business through word of mouth, Segal says.

Radding is a Boston-based author specializing in business and technology.

Professional Challenges in San Diego...

NCR

If you're ready to be a key contributor in the development of state-of-the-art TP systems, we want to meet you. You can get in on the ground floor of the design and development of a new high performance OLTP System.

NCR, Engineering and Manufacturing-San Diego, is seeking programmers to work on operating systems development in the following areas:

- UNIX* Kernel
- Commands & Utilities
- I/O Drivers
- Diagnostics
- System Administration
- User Interfaces (Windows)
- Database
- Data Management
- Transaction Processing Monitors

All positions require a BS or MS degree in Computer Sciences or related fields and a minimum of 2 years' directly related experience.

NCR offers a competitive salary and benefits package, including relocation assistance. Please send your resume with salary history to: NCR Corporation, Engineering & Manufacturing, Dept. CW-1-23, 16550 West Bernardo Drive, San Diego, CA 92127.

NCR...people working together to create value.

An equal opportunity employer.

* A trademark of AT&T

Senior Consultants Marketing Representatives Director of Education

Codd and Date, Inc. has several positions available for technical people expert in relational database management, several for marketing representatives, and one position for Director of Education.

Technical experts must have at least 4 years of experience in installing, designing databases and applications, and tuning IBM's DB2, plus at least two years experience in two or more additional relational database management systems (e.g., SQL/DS, ORACLE, INGRES, etc.). Additional requirements include teaching and training experience, as well as experience in courseware development.

Marketing representatives must have at least 4 years experience in marketing RDBMS products and/or services.

Director of Education must have a minimum of 10 years of DP experience and 2 years of experience with IBM's DB2 and at least one other relational DBMS. Knowledge is also required of the relational model and related technologies.

These positions are available primarily in the New York Metropolitan Area, the Delaware Valley, and the San Francisco Bay Area. However, qualified applicants who prefer other areas will be considered.

All positions require excellent command of English (both oral and written) plus excellent pedagogic and presentation skills. The job entails some travel within the United States, Canada, Europe, South America, and Australia.

Please submit resumes to:

Personnel Dept. - CW
Codd and Date, Inc.
P.O. Box 20038
San Jose, CA 95160



data processing

FLORIDA OPPORTUNITIES

At Nielsen Media Research, your talents as a Systems Development professional will be put to good use. We are the leading supplier of marketing research information on television and VCR viewing habits. You will be challenged to provide our customers with state-of-the-art products.

Our facility is located on the Sun Coast of West Central Florida, where you'll encounter a beautiful climate, no state income taxes, a \$25,000 homestead tax exemption, low cost-of-living and year 'round outdoor recreational activities.

PL/I Professionals

Requires a BS in Computer Science with two or more years experience in the design, development and testing of applications programs using PL/I in a data base environment. Experience with VM/CMS, VSAM, MVS/JCL, CICS and TSO/ISPF is highly desirable.

A salary commensurate with experience, comprehensive benefits, flex-time and paid overtime are but a few of the reasons you should consider this opportunity.

For immediate and confidential consideration, send a current resume or letter to Nielsen Media Research, Human Resources, Department DN-1120, 375 Patricia Ave., Dunedin, FL 34698. All inquiries will be answered.

Nielsen Media Research

a company of
The Dun & Bradstreet Corporation

an Equal Opportunity Employer
m/h/v

Senior Software Engineers

We are looking for people with strong technical expertise to help us expand and enhance our Digital Document Management System software products for international markets. Candidates should have three or more years experience developing products for VAX/VMS, UNIX/ULTRIX-32, or OS/2. They should be self-motivated and team-oriented, with a strong desire to take software projects from initial requirements to completion. Experience in applications level development is desired, particularly in the areas of: insurance, banking, financial, pharmaceuticals.

We are looking for people to fill the following positions in Rochester, New York:

- User interfaces, X-Windows, FIMS
- Distributed applications, VAXcluster environment
- Heterogeneous development environments
- Software release management
- Automated regression testing
- System crash analysis and troubleshooting
- System performance analysis and capacity planning
- Revisable and final form compound document applications
- Software development supervisor
- Relational database: RDB, SQL
- PASCAL, C, VAXset, software development tools
- Object-oriented programming techniques
- Knowledge engineers
- Computer modeling and simulation: GPSS

Of course, we offer liberal benefits and more than a competitive salary to attract and keep the people we need. We provide opportunities for advancement plus rewards and recognition based on your performance with us.

If you're interested in challenge and opportunity for growth, send your resume to: **Personnel Resources, Dept. DCCR, Eastman Kodak Company, Rochester, NY 14650-1139.**

Kodak.

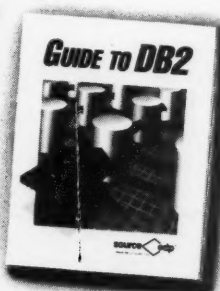
The right place.

The right time.

An equal opportunity employer



FREE DB2 Guide!



If you're in programming, systems analysis or design—and you plan to use DB2—our latest **Guide to DB2** could help make things easier

Guide to DB2 is written in a clear, concise format to aid busy professionals. It's the perfect way to gain insight into complex information. Specifically, in a series of easy-to-understand charts, graphs and text, you'll learn about critical data on DB2 architecture, objects, Structured Query Language and more.

In less than 25 pages, you'll have a good start towards a more complete understanding of the versatility of DB2—and more importantly—how you can use it in your applications.

Call 1-800-392-7900, extension 100 (In Canada call: 416/591-1110)

Call anytime 7 days a week for your free copy. Or write: Department NU1, P.O. Box 7571, San Mateo, CA 94403-7571.

source edp
Computer Recruiting Specialists

DB2 is a registered trademark of International Business Machines Corporation.

PROGRAMMERS, ANALYSTS

SCANA Software is the information services arm of SCANA Corporation - the \$2.5 billion utilities industry leader. Our Professional Services Division provides technical services to Fortune 500 clients throughout the Southeastern U.S.

SCANA Software Services is seeking Programmers and Programmers Analysts with at least 2 years programming experience in one or more of the following:

IBM 30XX and 43XX
MVS/XA, CICS, ADABAS, NATURAL, COBOL, DB2, IMS, ADFS, FORTRAN, AMPLAS, MCCORMACK & DODGE.

HP 3000
COBOL, FORTRAN, POWERHOUSE, QUICK, QUIZ, QUERY, IMAGE

DEC VAX
FORTRAN, INGRES, COBOL, RDB

SCANA Software Services, Inc. offers an excellent compensation package including a wide range of benefits.

Please send resume to:
**Recruiter
SCANA Software Services
P.O. Box 51140
Columbia, SC 29260-1140**



EOE/M/F/H/V

SENIOR SYSTEMS ANALYST

We have an immediate opening for a Data Processing professional seeking a challenging and creative environment. The position is for a Senior Systems Analyst to design, evaluate, lead, and analyze all types of development, enhancement, and maintenance projects.

Requirements include 5 years of IBM assembler language, 2 years of LISP-COMM, or an equivalent system, and 2 years of insurance experience. Knowledge of COBOL, or Oracle DBMS, will be helpful. In addition, you must be able to work in an IBM MVS/XA, JES2 JCL environment.

This position will be located at our international headquarters in sunny Florida, just south of Miami. We offer an excellent financial package, benefits program and full relocation assistance. For immediate consideration please send your resume to: **Ellen Rifkin at 11222 Quail Roost Drive, Miami, FL 33157.**

AMERICAN BANKERS INSURANCE GROUP
EOE

Sunbelt Opportunities

CICS Programmer (MVS or OS/2)	30-35K
ASSEMBLER Programmer (OS/2)	29-34K
DB2/IMS Programmer	30-34K
COBOL Programmer	29-34K
ADABAS Programmer	30-34K
System 38 Programmer (OS/2)	29-34K
MANCO Programmer (OS/2)	30-34K
MSI DBMS Programmer	29-34K
DB2 SQL Programmer	30-34K
ORACLE SQL Programmer	29-34K
FOCUS Programmer	29-34K
MSA Programmer or Sys Analyst	30-34K
McCormack & Dodge Programmer	30-34K
DB2/AS/400 Programmer	30-34K
IBM Programmer or Sys Analyst	30-34K
Insurance (PMS) Programmer	30-34K
LeClerc/Life/Health Programmer	30-34K
MVS/XA Sys Prog	30-34K
MS or OS/2 Data Base Analyst	43-55K

Charter's largest executive search firm, in business since 1975, 300 affiliates. We place candidates in the Southeast and nationwide. Our client companies pay relocation and interviewing expenses, and our fees.

Corporate Personnel Consultants
1705 23rd Lane S.E., Des Moines, IA 50311
(515) 281-1980
Attn: Rick Young, C.P.C.

MAINE - NH

We have specialized in data processing professional placement in Maine & NH for a quarter of a century. If you qualify for positions in the \$25,000-\$50,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC
Attn: Dept. 2
P.O. Box 7040075
Portland, ME 04112
(207) 773-4748

COMPUTER CAREERS



Computer Professionals: Some people have won simply because they refused to lose.

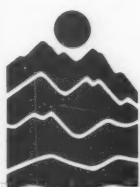
The true measure of a man or woman is how they handle adversity in seeking their career objectives. Certainly it is easier to surrender than it is to fight...but that, obviously, does not lead to victory.

Yet the decision to fight for what you want dictates that you must have some staunch allies to help you in your battle. You'll find them at NCA. We can "give you the tools you need so you can finish the job." They are: thousands of career opportunities, thousands of client contacts (locally and nationally), skilled and experienced counselling and professional representation.

Come in. Call. Or mail your resume to the NCA firm nearest to you. No charge to you ever. Confidentiality is assured. We can advance your computer career as we have for thousands of others. You may then be moved to say, "Never has so much been owed by so many to so few."

National Computer Associates

ATLANTA: DataPro Personnel Consultants
400 Peninsula Center Terrace, Suite 500
Atlanta, GA 30340 (404) 292-4242
BALTIMORE: CPM, Inc.
6170 York Road
Baltimore, MD 21212 (301) 377-0015
BOSTON: Robert Kline & Co., Inc.
P.O. Box 100
Lynnwood, MA 02172 (617) 861-1020
CHICAGO: Thomas Hertz & Associates
150 North Wacker Drive, Suite 1700
Chicago, IL 60606 (312) 877-1555
CINCINNATI: Task Group
7815 Reading Road
Cincinnati, OH 45227 (513) 821-8275
CLEVELAND: Innovative Resources, Inc.
Super Office Tower, Suite 408
East 12th & Euclid
Cleveland, OH 44115 (216) 821-4230
DALLAS: Michael Thomas, Inc.
455 W. Wilson Bridge Road, Suite 340
Wortham, TX 75085 (817) 846-0026
DENVER: Dunlap Personnel Consultants, Inc.
13355 North Road, Suite 200
Dallas, TX 75240 (214) 611-8600
Detroit: Matrix Consultants, Inc.
1777 South Harrison Street, Suite 404
Detroit, MI 48210 (313) 726-0664
HOUSTON: Electronic Systems Personnel
200 Town Center, Suite 200
Houston, TX 77056 (713) 626-4100
INDIANAPOLIS: The Consulting Forum, Inc.
P.O. Box 100
Carmel, IN 46032 (317) 843-5585
KANSAS CITY: OP Laser Associates
8001 Metcalf, Suite 302
Shawnee Mission, KS 66202 (913) 236-6208
LINCOLN: Superior Resources, Inc.
22653 Pacific Coast Highway, Suite 1-108
Miami, FL 33055 (305) 884-3000
LOS ANGELES: Data Sciences Personnel, Inc.
P.O. Box 857
Hollywood, FL 33024 (305) 434-6112
MINNEAPOLIS: EDP Consultants, Inc.
Chambers Park I, Suite 350
350 N. Hennepin Avenue
Bloomington, MN 55402 (612) 797-8865
MONTREAL, QUEBEC: Electronic Systems Personnel
800 West Avenue South
Montreal, QC H3C 5G2 (514) 238-6714
NEW JERSEY: Systems Search
2500 Millburn Avenue
Millburn, NJ 07040 (201) 761-4400
NEW YORK: Solar Associates, Inc.
730 West Street, Suite 410
New York, NY 10007 (212) 227-7703
PHILADELPHIA: Systems Personnel, Inc.
115 West State Street
Philadelphia, PA 19106 (215) 565-0880
PITTSBURGH: Professional Career Consultants
4225 North Scarborough Road, Suite 278
Scottsdale, AZ 85251 (602) 274-6666
PITTSBURGH: KCS Computer Services, Inc.
400 West 10th Street, Suite 325
Minneapolis, MN 55402 (612) 825-8632
PORTLAND: Tenor Confidential Ltd.
10 Gable Street, Suite 400
Portland, ME 04101 (603) 325-4810
SAN DIEGO: Technical Directories, Inc.
5005 La Jolla Village Drive, Suite 200
San Diego, CA 92161 (619) 597-5611
SAN FRANCISCO: The Computer Resources Group, Inc.
303 Sacramento Street
San Francisco, CA 94111 (415) 386-3535
SEATTLE: Houser, Martin, Morris & Associates
110 11th Avenue S.E., C-100
Bellevue, WA 98009 (206) 453-2700
STAMFORD: Houser, Martin, Morris & Associates
257 Summer Street
Stamford, CT 06901 (203) 357-9487
STANFORD: CPA Associates Personnel Inc.
5730 Woodlawn Parkway
Dulles, VA 22024 (703) 466-9492
WASHINGTON DC: Bill Harty & Associates
3222 Professional Hill Drive
Farmingdale, VA 22031 (703) 573-4008
AUSTIN: For information, contact the NCA firm nearest to you.



Higher Aspirations? Join the StorageTek Team in Colorado.

Today, Storage Technology Corporation is the only information storage and retrieval company offering a complete line of offline, Nearline™ and online solutions, solid state disk, tape and printer products.

Because we address the entire hierarchy of data storage from high performance DASD to printer products, we can outperform the competition hands down.

Senior Documentation Specialist

You'll coordinate the installation of configuration management systems for processes and software used in our Thin Film Manufacturing Plant. Duties include designing change control and cataloging systems and producing policy documents. To qualify, you must have a degree in library science, technical writing or equivalent and a minimum of six years' related experience. Project librarianship experience is desirable.

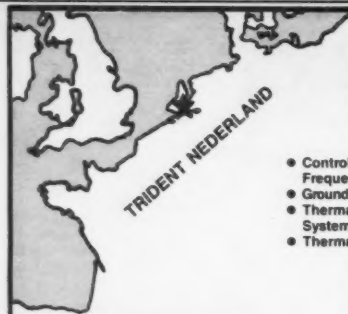
At StorageTek, you'll enjoy the stimulation of working with the top-flight technical talent in the business, and you'll warm to our climate, culture and unlimited recreational activities. That's the beauty of StorageTek in Colorado.

For immediate consideration, please send your resume to Barbara C. Rucker, Storage Technology Corporation, Department CW35, 2270 South 88th Street, Louisville, Colorado 80028-3159. We are an equal opportunity employer.

The Information Storage and Retrieval Company

StorageTek

COMPUTER CAREERS



EUROPEAN AERO-AEROSPACE OPPORTUNITIES

Trident Computer Services Group, Nederland, Inc., based in Holland, now seeks highly skilled, experienced and motivated Engineers/Consultants for major European Aero-Aerospace companies. The assignments are long-term and based in major European cities. The engineering skills we seek include:

- Control - Low Frequency Electronics
- Ground Control Systems
- Thermal Control Systems
- Thermal Dynamics
- Composite Technology
- Structures and Design
- S W Engineering - Military Environment
- Marine Systems Engineers

Also, we are interested in Engineers with other skills and an interest in relocating to Europe.

Please send your resume to:
TRIDENT COMPUTER SERVICES
33 Boston Post Road - W
Marlboro, MA 01752
Attn: Bill Haley

TRIDENT
COMPUTER SERVICES INC.

WE ARE A TWO YEAR OLD FRENCH COMPANY SPECIALIZED IN SOFTWARE DEVELOPMENT, SYSTEMS INTEGRATION, COMPUTER AIDED PUBLISHING AND PROFESSIONAL TYPESETTING.

OUR ADVANCED EXPERTISE IN NETWORKS, DATA BASE MANAGEMENT AND COMPUTER AIDED PUBLISHING ON UNIX O.S. ENABLES US TO WIN THE CONFIDENCE OF THE LARGEST NATIONAL COMPANIES.

WE ARE LOOKING FOR PARTNERS IN THE SCOPE OF COMPUTER ENGINEERING (I.B.M. - DEC - SUN) TO WIDEN OUR ACTIVITIES IN EUROPE, USA AND CANADA.

FOR FURTHER INFORMATION PLEASE CONTACT

THE FRENCH CHAMBER OF COMMERCE

MME VILCOT / MR JOSEPH SIMMON
TEL. 33 1 47 42 61 49
FAX. 33 1 42 66 13 94
TELEX 290 893

IMMEDIATE OPENINGS

Assembler Progr.	\$35,000
ADABAS/NATURAL	to \$2,000
IMS DB/DC or M204	50,000
DB2, SQL	40,000
System 38 (RPGIII)	32,500
FOCUS or NOMAD	30,000
ADP/Datacom	40,000
CICS, other comm.	39,000
Consulting	100,000
Contractors	to 75/hour
DB Administrators	to \$5,000
EDP Auditing	40,000
Software Engineers	60,000

THE LESLIE CORPORATION
400 E Sam Houston Pkwy
Houston, TX 77060
(713) 591-0915

The Leslie Corporation is a national and international recruiting organization, with offices across the U.S. All fees are paid by our clients.

Ten Offices
Coast to Coast

National Contract Opportunities

Windows INGRESS
DEC/VAX AI
DEC/VAX ISDN
Mainframe, Minis & Micros
Databases, 4th GLs, & LANs
Call or send resume to
214-490-1966
Sue Latham
12700 Park Central Dr.
Suite 1501
Dallas, TX 75251

S/38 - AS/400

Dunhill of Albuquerque is concerned about YOU! We care about your personal priorities as well as your professional development. This personalized attention has made us the leading national placement specialists for IBM S/38 professionals since 1981. Today, with numerous clients going to the AS/400, the demand for programmers and programmer/analysts with 1+ years of experience has never been greater. Using your skills, our marketing knowledge, and the Dunhill System of 300 offices nationwide, we can work together to attain your goals. Call or rush a resume to Deanna Geer

DUNHILL OF ALBUQUERQUE, INC.
1717 Louisiana NE, Ste. 3142
Albuquerque, NM 87110
(505) 282-1871
Never a Fee to a Candidate

Computer Software Engineer wanted to analyze complex systems requirements; design, develop and customize manufacturing and banking application systems on UNISYS medium and large system (B3955, A3) using BPL, TCL, DMS II, COBOL, WFL, NDL, UNISYS manufacturing packages like PCS III and TMS; conversion from IBM to UNISYS 3900. Requires B.S. degree in Mechanical Engineering or Computer Engineering and two years experience: \$42,000.00 per year; 40 hours per week. Send resume to 7510 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #82088 "Employer Paid Ad"

SSI has immediate and upcoming opportunities in the Carolinas and neighboring states for DBAs, P/As and S/As in the following areas. Send resume, or call Ed Bales toll free 1-800-535-5079.



- COBOL, CICS
- IDEAL, DATACOM
- NATURAL, ADABAS (IBM or DEC)
- IMS, DB2, VSAM
- HP 3000 or HP 1000
- SYS/38 or AS/400
- DEC VAX, FORTRAN
- CSP or TELON
- UNIX, C

"From the Mountains... to the Coast"

9101 Southern Pines Blvd., Suite 290
Charlotte, NC 28217 (704)-522-6321

RESEARCH TRIANGLE OPPORTUNITIES

Currently recruiting experienced computer pros with background in any of the following: IBM COBOL mainframe applications; CICS, DB2, IMS, ADABAS, ORACLE, DB2, FOCUS, ADR, DATA, COM, SAS, VM/CMS, S/38, RPGII or COBOL, DEC VAX COBOL or FORTRAN, HP3000, Series 7, Financial Mfg., Bankers Insurance, MSA, Point of Sale, MVS, VM, NCP, VTAM or CICS Systems Progs, DEC VAX Systems Mgrs, Database Analysis, Method 1 or similar methodology. Partial listing of local, regional & national paid positions. Call or write:

The Underwood Group, Inc.
3928 Bowering Pl., Suite 7
Raleigh, NC 27605
(919) 782-3024

Programmer/Analyst Hewlett Packard Experience

A major manufacturing company in the New Orleans area is seeking an individual with five plus years experience in COBOL and programming productivity aids to join its EDP Department. This person must be a problem solver with good communication skills for analyst duties.

The department employs state-of-the-art hardware and on-line processing within a network data services environment. Business applications range from financial to manufacturing systems. Salary commensurate with experience including excellent company-paid benefits. Send resume to:

CW-85113
Computerworld
Box 9171
Framingham, MA 01701-9171

DB2/ADABAS TECHNICAL SUPPORT

Worldwide vendor of ADABAS and DB2 utility software has tech support openings at headquarters in the Seattle, Washington area. Excellent compensation and benefits. Dynamic, informal working atmosphere.

Provide tech support to prospects, clients and international distributors via phone, FAX, telex. Participate in quality assurance. Interface with product development and marketing staffs.

Requirements: excellent analytical and communication skills; training and experience in DB2 and ADABAS; strong working knowledge of IMS facilities; JCL, TSO. Familiarity with CICS, IMS-DC, BAL helpful. Send resume to: Database Utility Group, Inc., P.O. Box 4129, Federal Way, WA 98003.

ATTENTION D.P. PROFESSIONALS

Thanks to YOU, the DP community, VIP Personnel, Inc., est. in 1967, was recently named in INC. magazine's "INC. 500" as one of America's fastest growing private companies.

We specialize in IBM S/38/400, IBM 43XX, IBM30XX & HP3000 placements.

Call (919) 471-6404 or FAX us your resume to (919) 471-4044.

WIP Personnel, Inc.
3101 Guess Road, Ste C
Durham, NC 27705-2664

CONTRACT & PERMANENT

Several opportunities exist for experienced DP Professionals in S.W. Pennsylvania & North Central West Virginia. Seeking candidates with varied applications, especially financial & manufacturing, and any of the following:

- CICS
- DB2
- IMS DB/DC
- MRP
- RPO III
- MAC PAC
- DB2

Compensation between \$20 & 30/hr

Shannon Industries, Inc.
P.O. Box 10395
Pittsburgh, PA 15234
(412) 344-4868

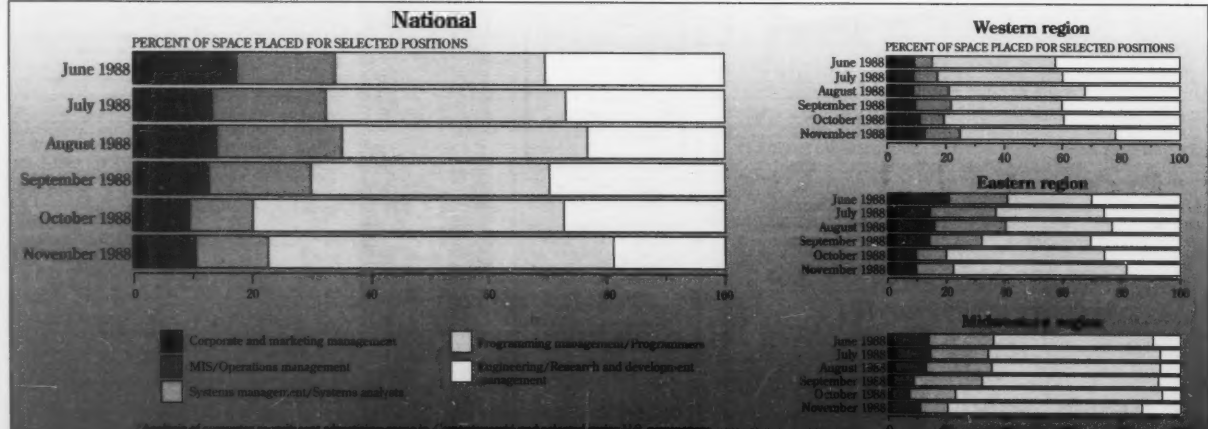
Systems Analyst/Programmer - Partake in design, development, testing, implementation and documentation of specifications. Requires Bachelor's or equivalent (9 months professional experience - 1 year academic) in Data Processing, Computer Science or Systems Analysis and 2 years experience including NATURAL, PL/I, CICS and Database environments - ADABAS, IMS DB/DC. Salary \$37,000 per annum. Job Location: Gardena, CA. Resume to: International Management Consulting Corporation Inc., 16500 South Western Avenue, Suite 102, Gardena, CA 90247, Attention David Sturman.

Rapidly growing New York, New Jersey and Connecticut area consulting firm looking for ambitious super D.P. Professionals for State-of-the-Art projects. We need all skills including: SUN WORKSTATIONS, TELON, UNIX/C, DB2, DB2/C, C/SOL, CICS/C, ADMINISTRATORS (UNIX & UNIX), TESTERS (UNIX) and VAX/VMS.

Please call or send resume to Tekmark Computer Services, Inc., 37 East 29th St., New York, NY 10018. (212) 686-9360, Fax# (212) 686-4047.

CAREER INDEX

Computer recruitment advertising activity*



SOURCE: CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATA BASE
CW CHART: FRANK C. O'CONNELL

POSITIONS AVAILABLE AT KENYON COLLEGE:

DIRECTOR OF ACADEMIC COMPUTING DIRECTOR OF NETWORKS, SYSTEMS AND TECHNICAL SERVICES

Kenyon College, a private, coeducational, residential, undergraduate institution with a long history of excellence in liberal arts education, seeks applicants for two leadership positions in the division of Information and Computing Services.

DIRECTOR OF ACADEMIC COMPUTING

Responsibilities: Promote use of computing across the curriculum; Demonstrate exemplary use of computing in teaching one academic course per year; Manage user support staff and services.

Qualifications: Broad knowledge of computing in an academic setting; Significant experience with software applications; Excellent speaking, writing and teaching skills; Academic qualifications required to teach in an academic area which is part of the Kenyon curriculum.

DIRECTOR OF NETWORKS, SYSTEMS AND TECHNICAL SERVICES

Responsibilities: Manage campus networks, VAX clusters and micro-computer systems; Direct Technical Services operation which maintains computing and networking equipment; Supervise systems, operations and technical services personnel.

Qualifications: Broad networking, data management, technical support and computing experience; Excellent communication skills; Bachelor's degree.

Both positions: Require strong interpersonal, managerial, organizational and problem solving skills; Will participate in strategic planning, budget management and resource allocation activities.

For further information, contact:

**Thomas F. Moberg, Vice President
Information and Computing Services**
Kenyon College
Gambier, Ohio 43022
614-427-5596

Application review will begin March 1 and continue until positions are filled. Kenyon College, an equal opportunity employer, encourages applications from minority and women candidates.

ANNOUNCING A NEW POSITION

Information System Coordinator for A Major Southwestern County Government

Maricopa County, which includes the Phoenix Arizona metropolitan area, is searching for the right individual to coordinate a major strategic restructuring of the County's Information Systems organization. The successful candidate will work with the managers of the County's six functional information systems centers to produce and maintain a comprehensive County-wide long range information systems program. This key staff position will provide technical advice and staff support to the Board of Supervisors, the County Information Systems Steering Committee and the County Manager. He/she will also have responsibility for coordinating and completing the annual budget requests required to implement the program. In addition, the Information Systems Coordinator will implement County-wide policy, and recommend procedures and standards for data processing.

Maricopa County has 11,000 employees and a \$1 billion budget. The County is a dynamic growing organization with a "can do" attitude toward problem solving. Phoenix offers a sophisticated urban environment with numerous cultural amenities. Sports enthusiasts can watch professional football and basketball, play golf on over 70 public courses or take advantage of the close by recreational resources that offer hunting, fishing and winter sports. Attractive housing prices, excellent schools and an ideal climate make Maricopa County a great place to raise a family.

This challenging staff position requires demonstrated success in the management of a large budget, multi-faceted, highly visible data processing organization. Public sector experience is very desirable. Candidates should excel in all communications skills - listening, speaking and writing. Strong negotiation and facilitation skills are mandatory. Creativity, innovation and a broad perspective of the technology available are also required. Success in this position will require high integrity and the ability to promote trust and cooperation between the diverse functional elements of the County. The County is very interested in finding the right individual who will make a long term commitment to the County and this position. The salary range is \$75K to \$85K and includes an excellent benefits package.

If you meet the criteria above and you would be challenged and rewarded by a staff position of this scope please send your resume by February 15 to:

Weber & Weber
Department MC
1275 Market Street
Suite 1300
San Francisco, California 94103

Maricopa County is an Equal Opportunity Employer.

NEW YEAR'S INVITATION TO:

Programmers, Analysts & Consultants FROM **THE MATRIX ORGANIZATION**

**MAKE 1989 YOUR YEAR FOR PROFESSIONAL
ACHIEVEMENT AND ADVANCEMENT**

We're Expanding Immediate Opportunities for
IBM and DEC Professionals With:

PACBASE	DATA/COM/IDEAL	EDI
DB2/SOL/OMF	IMS/ADF	HP 3000
LANs	CICS, COBOL	FMS
ADABAS/NATURAL	INGRES	FOCUS
ORACLE		TELEON
VAX/VMS		

We offer diversified assignments, continuing education and outstanding compensation and benefits package including paid sabbatical, health club allowance and profit sharing.

Please call or rush your resume to:

BOSTON Linda O'Byrne 112 West St. Liberty Square Boston, MA 02109 (617) 227-1980	PHILADELPHIA Mary Beth Mellor Suite 300 480 Devon Park Dr. Wayne, PA 19087 (215) 227-1980	WILMINGTON Janet H. Goude 501 Silverdale Rd. Wilmington, DE 19809 (302) 792-1980
--	---	---

Additional opportunities available nationwide.

MATRIX
The MATRIX Organization, Inc.

KENDA SYSTEMS, INC. BOSTON • NEW YORK • WASHINGTON SOFTWARE CONSULTANTS

KENDA SYSTEMS provides consultants to the East Coast High Tech Community. Talented professionals who take pride in their work are welcome to register with KENDA SYSTEMS.

- *DB: VAX/VMS/PASCAL/RDB/DOO
- *REAL TIME: VAX/VMS/SIGNAL PROCESSING/DOO
- *DATABASE: SOL/MS-WINDOWS/ NETWORKING
- *PROCESS CONTROL: SUN/UNIX/C/ASM
- *QA TESTING: PC/C/ASM
- *TECH WRITER: HARDWARE/MILITARY DOCUMENTATION
- *QA TESTING: PC/TESTSCRIPTS/1-2-3 OR SYMPHONY
- *HARDWARE DRIVERS: AT PROCESS CONTROL/UNIX/ROBOTICS
- *SYSTEMS PROGRAMMER: DG AOS/VSC

Forward resume to Richard Pierce.

2 Manor Pkwy., Salem, NH 03079 603/898-7884

MOVE UP TO CIBER

CIBER is a data processing consulting firm employing over 280 consultants nationwide. Our employees are salaried and receive generous benefits including relocation assistance. Offices are in Phoenix, Sacramento, San Francisco, Houston, Dallas/Ft. Worth, Detroit, Atlanta and Denver.

If you have a minimum of 3 years experience, we can offer you a wide range of technical opportunities in diverse industries using the latest systems and computer technology. Openings are currently available at the following locations for data processing professionals who are experienced in these preferred fields:

HOUSTON

DB2
TELEON
FOCUS
NOMAD II
SAS, AF
IMS, IMS
CICS, ADF
COBOL, PL1
PCs, LAN
HP3000
DEC VAX
PICK

Norma Oritz
1600 Smith
Suite 4225
Houston, TX 77002
(713) 658-0481

PHOENIX

DB2
IMS DB/DC
Suite 4225
DATA/COM/IDEAL
ADABAS/NATURAL
MARK IV
TELEON
TRANSFORM
PC/ADS PACKAGE
MACPAC/D

Verna Van Dyne
3003 N. Central Ave.
Suite 2512
Phoenix, AZ 85012
(602) 234-0411

DALLAS/FT. WORTH

IMS DB/DC
DB2
CICS
TELEON
ADABAS/NATURAL
FOCUS
MODEL 204
ADABAS/NATURAL
TANDEM
ADF II
ARTIFICIAL INTELLIGENCE
CREDIT CARD SYSTEMS
FORTRAN
COBOL, C
MSA
PICK BASIC
HONEYWELL
DEC VAX

Angela Battani
2121 San Jacinto Tower
Suite 1960
Dallas, TX 75201
(214) 754-1810

NORTHERN CALIFORNIA

IMS
ADS/O
DB2, CSP
ADABAS/NATURAL
COBOL, CICS
ISI HUMAN RESOURCES

Gary Preston
1010 Hurley Way, Suite 300
Sacramento, CA 95825
(916) 929-2729

CIBER
An Ethic of Excellence
An Equal Opportunity Employer

Application Development Systems, Inc., creators of

XPEDITER

has high-growth opportunities for quality-minded individuals. Our customers demand and deserve the very best. If you fit the bill, we have a place for you in one of the following positions:

TECHNICAL CUSTOMER SUPPORT REPS: Provide hotline technical support in our San Jose office.

SOFTWARE INSTRUCTORS: Provide on-site user training. Extensive travel. Positions available in San Jose.

FIELD SUPPORT REPS: Provide installation and training support. Positions available in northern New Jersey and Minneapolis.

The above positions require a minimum of two years of IBM COBOL programming experience. Experience with one or more of the following is desirable: IMS DB/DC, CICS, and DB2.

ROSCOE SYSTEMS PROGRAMMER: Develop and maintain products executing under ROSCOE.* IBM Assembler skills and two years experience with ROSCOE required. Available in San Jose.

DEVELOPMENT AND MAINTENANCE PROGRAMMERS: Develop and maintain state-of-the-art products. Five years experience with IBM mainframe assembler programming. Knowledge of system internals required. Experience in one or more of the following is highly desirable: CICS, IMS, DB2, ISPF, Dialog Management, ROSCOE. Both senior and mid-level positions available in San Jose and Minneapolis.

SOFTWARE SALES REPS: Represent XPEDITER and other innovative productivity products. No sales experience required. A minimum of two years of application experience in an IBM mainframe environment. Familiarity with COBOL, TSO/ISPF and online environments desirable. Positions available in Minneapolis.

Outstanding benefits package, non-contributory health insurance, 401K with company contribution, profit sharing and excellent opportunities for career growth. Interested? Call 800-538-7822 or send your resume to:

ADS

Application Development Systems, Inc.
525 Race Street, Suite 290
San Jose, California, 95126
Attention: Personnel

"REQUIRED"

A leading Saudi Computer Company intends to appoint a

PROGRAMMER

knowledgeable in writing compilers and interpreters. The applicant must be an energetic, smart, and talented person; who is freshly graduated from University with high academic achievement grades, and skills. If the above description fits you, please send your C.V. and relevant information to:

P.O. Box 43379
Riyadh 11561 Kingdom of Saudi Arabia
Attention: MIS Manager

Is Finding a Great New Job in 1989 One of Your New Year's Resolutions?

Datronics is a major consulting company seeking programmers and analysts for full time, salaried positions on our senior technical staff. Since our incorporation in 1976, Datronics' rapid growth has resulted in the addition of seven regional offices including London, England. We offer competitive salaries, overtime pay, complete benefits package, and relocation assistance.

If you have 2+ years of industry experience in any of the following, WE WANT TO TALK TO YOU NOW!

- COBOL
- IMS DB/DC
- DB2
- TELEON
- CICS
- FOCUS
- IMS DB/DC
- ADABAS/NATURAL
- IDMS/ADSO
- WANG/PAGE
- ORACLE
- PROJECT LEADERS

For information call collect at (214) 596-8200 or send your resume to: Candy Congdon, Datronics, Inc., 1700 Alma Road, Suite 240, Plano, Texas 75075. (All responses will be considered confidential.)

Equal Opportunity Employer M/F

datronics inc.

UNISYS Programmers

We are engaged exclusively in the permanent placement of UNISYS PROGRAMMERS and ANALYSTS throughout the United States. If you have one to ten years experience on any Sperry or Burroughs heritage mainframe computer and have any specific technical or geographic interests we may be able to help. Our services are free to the individual. Please call us today or send resume to:

COMPUTER STAFFING CONSULTANTS
10061 Talbert Avenue, Fountain Valley, CA 92708
714-964-2622

CONSULTANTS CONTRACTORS EMPLOYEES

Human Resources,
Payroll/Personnel
CICS/VSAM, DB2

Please send resume to: Integral Systems, Dept. PS,
2185 North California Blvd., Walnut Creek, CA 94596.

Principals only please. We are an equal opportunity employer.

Systems Programmers

IBM/VSAM Sys. Prog. (Genl./Transp.) \$40K
MVS/TA Sys. Prog. (Genl./Transp.) \$40K
MVS/TA Sys. Prog. (Mainf./Transp.) \$40K
CICS Sys. Prog. (Mainf./Transp.) \$40K
MVS/TA Sys. Prog. (Mainf./Transp.) \$40K

Please send resume to
Robert Montgomery or
call 919-787-4205.

The Data Group
P.O. Box 52055
Raleigh, NC 27612

Consulting Opportunities

Programmers, Designers, Analysts, DBAs, Technical Writers, System Analysts, Administrators. Engineers sought for per diem and permanent positions:

- DB2, SOL
- CICS, IMS
- IMS
- COBOL
- PL1
- REXX
- SYBASE
- ORACLE
- IDMS
- ADABAS/NATURAL
- ENCL. (encl. & text)
- TPF
- PCs
- DESIGN ENGR'S
- SOFTWARE ENGR'S
- HARDWARE ENGR'S
- MECHANICAL ENGR'S

Other positions also available. Please call or send resumes to:
Structured Logic Systems, Inc.
2470 Windy Hill Road, Suite 304, Atlanta, GA 30067
Two Penn Plaza, Suite 1540, New York, NY 10121
1-800-537-1132

Must Have Minimum Two Years Experience
GEORGIA • NEW YORK • NEW JERSEY • TEXAS • MASSACHUSETTS • DC

DATA PROCESSING CAREER OPPORTUNITIES

AMERICAN GREETINGS, the world's largest publicly-owned manufacturer of greeting cards and a member of the Fortune 300, is presently seeking individuals to join our Data Processing department at our corporate headquarters in Cleveland, Ohio.

Due to on-going corporate expansion, we currently have opportunities for the following professionals:

- DB2 Analyst Programmers (2-5 years experience)
- CADD Analyst Programmers (2-3 years CADAM experience)
- IDMS ADS/O Analyst Programmers
- DB2 Database Consultant
- PL/I Analyst Programmers
- Fortran Analyst Programmers

We are prepared to offer those qualified and experienced individuals an outstanding benefit package which includes exceptional growth potential and salary commensurate with experience. To find out more about these Systems Opportunities, please phone:

(800) 221-3333,
ext. R19
24 HOURS PER DAY;
7 DAYS A WEEK



AMERICAN GREETINGS

We are an equal opportunity employer.

TRY OUR 24 HOUR ON LINE DP JOB LISTINGS

CALL
919-222-0979

DP RESOURCES, INC.
P.O. Box 5057
Burlington, NC 27216-5057

ATLANTA & SOUTHEAST

\$25,000 to \$75,000

IDMS, ORACLE, DATACOM, IMS, DB2, SYS 38
VAX, MAPICS, FOCUS, CAM/CAM/CAE
TECHWRITERS/DP SALES/IDMS

Need Programmers, Programmer-Analysts for Full-Time and Consulting Positions in IBM Shops. Relocation Expenses Paid. Send resume to:

Jim Heard, EDP Consultants, Inc.
3067 Bunker Hill Road, Suite 202
Marietta, Georgia 30062

FAX:
404-973-4052

PHONE:
404-971-7281

COUNTY M.I.S. DIRECTOR (\$47,382 - \$67,994)

Collier County, Florida, seeks data processing professional with at least 5 years M.I.S. management experience, including multi-VAX Ethernet/DECnet network, COBOL, RPLS, & structured design, to lead a 14-member staff.

The Director will be responsible for planning and organizing all data processing related activities including hardware and software acquisitions, systems development and operations. Good communications and supervisory skills are imperative. Project management planning and implementation in a local government environment are necessary for success. A bachelor's degree in information science, business or related field is preferred. Qualified applicants must submit a resume, work & salary history, and references to:

James C. Glen, Clerk of Courts
Collier County, Florida
P.O. Box 413020
Naples, FL 33941

IDMS/ADSO

Fortune 100 client site — high tech manuf. environment — excellent salary, benefits and rel. Contractors welcome.

Computer Consulting Group

Contract Professional Services

Contact Us Today!

One Monckton Blvd.
Columbia, SC 29206
(803) 738-1994
Outside South Carolina
1-800-222-1273

PROJECT MANAGER

Major contractor and supplier of crushed stone, concrete, asphalt and building materials has an immediate need in the Nashville corporate headquarters for a Project Manager.

- BS in Computer Science or Business
- Minimum 10 years experience
- IBM mainframe with DOS preferred
- COBOL, CICS
- Proven leadership and team participation skills
- Working knowledge of M & D packages

Competitive salary and comprehensive benefits. Send resume and salary history to: Human Resources, P.O. Box 202560, Nashville, TN 37265. Equal Opportunity Employer M/F/H. Employer paid ad.



COMPUTER PROFESSIONALS

MSI, in response to growing client requests, is seeking ambitious DP Professionals to support our three business thrusts of:

- Data Processing Consulting
- Contract Programming
- Custom Software Development

POSITIONS TO \$50,000

Most assignments are 1 to 2 years in duration and involve large IBM Mainframe, Database and Data Communications development projects utilizing leading edge software systems and AGL's.

Send your resume to: Management Solutions Inc., 1416 South Third Street, Louisville, KY 40208

STATE OF THE ART SHOPS 100 DP OPPORTUNITIES

CICS-PAK, MVS or DOS	\$27-38K
CICS or DB2 - MVS Appl. Control	\$29-40K
MSI/DB2-PAK	\$29-38K
IDMS-ADSO-PAK	\$29-38K
ADAMS/AMT-PAK	\$29-38K
Base - IBM Run PAK	\$29-38K
Base - ALC LIFE COM LIFE 76	\$30-40K
MSA-PAK (JCL or Payroll)	\$30-40K
PLI-PAK	\$29-38K
COBOL	\$29-38K
Doc User - RDB	\$27-35K
YOCUS - DBASE	\$29-35K
IDEAL - DBASE	\$27-35K
Sp 28-PAK RPL or JCL or Control	\$27-35K
Sp 28-PAK RPL or JCL or Control	\$27-35K
MAPICS, RPLS or RPLS RPAK	\$27-35K
HP 2000, Control Copies	\$27-35K
HP 2000, Control AS/MASS	\$27-35K
UNIVAC 1100 PAK's Major	\$29-35K
DB2-PAK SQL	\$29-40K
Sp. Prog. MVS/PA, MCP, VTAM	\$29-40K
Data Base Arch. Bkl or DBMS	\$40-45K

Major Co.'s seeking confident professionals. D.P. Professionals w/ 2+ yrs. work exp. Locations: So. E.E. Mary Center & Nashville. Ad for our Free Resume Guide. Adv. T. Smith, D.P. Spec. (504) 295-1240

BADON'S DP DIV.
3027 GALERIA BAYVIEW HOUSE, LA 70814
Interviews & Fees Paid by Client Co. & Y

DATA PROCESSING PROFESSIONALS

Become a member of the team who has made the INC. 500 for the third year in a row! Enjoy state-of-the-art environment and challenging assignments with one of the Southwest's fastest growing consulting firms. Our offices are located in NASHVILLE, TN, COLUMBIA, SC, CHARLOTTE, NC.

Current openings for professionals with 2 or more years experience include:

- CICS, DL/I
- Natural/Adabas
- Q or I. Clearance
- VAX, Cluster Sys Mgr
- DB2 or Datacom DB
- Vary/POP Fortran w/Database
- IDMS, ADS/O, Cullinet Mfg.
- DEC, Oracle, Ingres or Rdb
- Basis
- Tech Writer, Scientist, or Eng. Doc.

We offer excellent salaries and benefits. Call or send resume to our Corporate Office TODAY!



AMERICAN
COMPUTER
PROFESSIONALS
P.O. Box 5125
Columbia, SC 29250
(800) 332-0555
equal opportunity employer

EXCEPTIONAL MIS OPPORTUNITY

Blue chip industry leader has two immediate management needs. Client is looking for fast track professionals that are promotable to director level positions. Requirements include MBA with 8-10 years progressive IBM MIS responsibility. Some consulting experience a plus. Must possess excellent communication skills, professional image, high energy levels and ability to grasp big picture business overview. Midwest location. Salary to mid \$5K plus 15% bonus, plus home purchase. For immediate consideration please send your resume.

Effective Search Inc.
Attn: Charles Miller, CMC
1980 North Audubon
Suite 218
Wichita, KS 67260

XEROX XBS PROGRAMMER ANALYST

We currently have an opening for a Programmer/Analyst who has one or more years of experience with Filer, Definier, and Reporter. The successful candidate must be a self-starter and enjoy working with users. An understanding of B-Code is a plus. We maintain a small staff of achievers who care about the quality of their work. If you meet the above qualifications, send your resume and salary history to:

PERSONNEL
P.O. Box 509
Worthington, Ohio 43085
An Equal Opportunity Employer M/F

COMPUTER PROGRESS CORPORATION

\$40,000 to \$60,000

We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for Programmers and Analysts in Kentucky, Ohio, Indiana, and Tennessee with one of the following skills.

NATURAL ADABAS

Send resume or call:
Computer Progress Corp.
12730 Townepeak Way
Louisville, KY 40243
(502) 245-8533

MEMPHIS/ MID-SOUTH

Centrally located to National client base. Specializing in the placement of data processing professionals qualified for positions in the \$25,000-\$50,000 range. Clients pay our fees, provide relocation and other great career opportunities.

ROMAC
Professional Recruiters
8000 Poplar Avenue, Suite 340
Memphis, TN 38118
801-880-8500 FAX: 801-884-1800
Darlene R. Murphy, Partner

COMPUTER PROFESSIONALS

Florida's Legislative Data Center is seeking qualified computer professionals for our mainframe applications section.

The ideal candidates must have programming and systems analysis experience in a large scale IBM environment (30XX) with MVS/XA and DBMS. A background in ADABAS and NATURAL is desirable. Graduation from a four year college or university plus three years experience or a combination of training and experience totaling seven years is required.

Excellent benefits, compensation commensurate with experience and an opportunity for career growth. Please mail your resume to:

Don MacDonald
Florida Legislature
Legislative Data Center
54 Holland Building
Tallahassee, FL 32399

S/38 Analyst/ Programmer

DHC Industries has an immediate opening for an analyst/programmer with proven database design experience.

The successful candidate will work independently to complete conversion of S/38-designed data files to field-described mode.

Further projects involve training in and use of the Synov2 application generator.

Send resume, references and salary requirements to:

Marcus P. Hagen
DHC Industries
1708 15th Avenue
Eldora, IA 50527
or call: (515) 658-2335

Our Fortune 500 clients in Ohio, Texas & Mo. have challenging and rewarding opportunities for professionals with 1+ years experience in:

PL1/MVS to \$39K
IMS/PS-1 to \$47K
IMS/DBA's to \$60K
Netview/VTAM to \$60K
RPG3/S38/AS400 to \$48K
TPF/ACP to \$115K

All positions offer excellent salary, benefit and relocation packages. If interested in these positions, or other opportunities, please contact our office or send your resume in strict confidence to:

JYI Computer Professionals
PO Box 471140
Tulsa, OK 74147
(918) 482-7535

When you compare costs and the people reached, Computerworld is the best medium for computer-related recruitment advertising.

Place your ads today!

Call toll-free
800-343-6474

Or in Mass
(508) 879-0700

Now...
you can recruit
the right people
in the right
places
at the right
price.

With the IDG Communications Computer Careers Network, you can run the most targeted and cost-efficient recruitment program possible. You simply choose the combination of four leading newspapers - Computerworld, InfoWorld, Network World, Digital News, Federal Computer Week - that's right for you.

For all the facts on putting the Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you. Or contact John Corrigan, Classified Advertising Director, at 508-879-0700.

Sales Offices:

John Corrigan, Classified Advertising Director, 508-879-0700

BOSTON: Nancy Percival, 800-343-6474. (in Mass. 508-879-0700)

NEW YORK: Warren Kolber, 201-967-1350; Jay Novack, 800-343-6474.

WASHINGTON, D.C.: Katie Kress, 703-573-4115; Pauline Smith, 800-343-6474.

CHICAGO: Patricia Powers, 312-827-4433; Ellen Casey, 800-343-6474.

LOS ANGELES: Barbara Murphy, 714-250-0164; Chris Glenn, 800-343-6474.

SAN FRANCISCO: Barbara Murphy, 714-250-0164; Chris Glenn, 800-343-6474.

MIS OPPORTUNITIES AT
BOEHRINGER MANNHEIM

ONE DISCOVERY
DESERVES ANOTHER

Boehringer Mannheim is a major biotechnology and healthcare organization with sales in excess of \$500 million dollars annually. Our existing and future hardware systems include IBM, Hewlett-Packard, DEC, Apple, and Unisys (Sperry), coupled with corresponding innovative software.

If you are prepared to join an environment that has experienced a high growth rate and anticipates a continued high growth rate throughout 1989, we are interested in talking with you.

Our MIS Group, located at our Indianapolis Corporate Headquarters, has been an integral part of our growth and will continue to play a major role in our expansion.

If you possess a background in any of the following areas and would like to become part of our team, we want to hear from you! We currently have the following positions open:

- INFORMATION CENTER MANAGER
- SYSTEMS ANALYSTS
- PROGRAMMER ANALYSTS
- DATA CENTER SUPERVISOR
- MIS TRAINER
- P.C. COORDINATOR

At Boehringer Mannheim, we offer an exciting and challenging work environment as well as an excellent compensation and benefit program including a 401K. Qualified applicants should send a resume with cover letter and salary history for confidential consideration. For information on other opportunities not listed above, please call our job line at (317)845-7035, or write to Dept. KSCW, Human Resources, Boehringer Mannheim, 9115 Hague Road, P.O. Box 50100, Indianapolis, IN 46250. An equal opportunity employer.

BOEHRINGER
MANNHEIM



A Terrific
Opportunity

Computer Consulting Group, one of the Southeast's fastest growing contract programming and consulting firms, has immediate openings for talented Programmer/Analysts with 2 or more years experience. Excellent salary/benefits package. We're especially seeking:

IMS/ADRS/NAHUF
NATURAL/ADABAS
VAL/COBOL
VAL/FORTRAN
WANG/COBOL
HYTRAN/ACT
VAL/COBOL
SAP/IMP
IBM PC/C
IBM PC/C/COBOL
OLIVETTI/DB2
COBOL/CICS
HP 1000/FORTRAN
DEC/PDP/11
VAL SYS MGR
TECH WRITERS

Computer
Consulting
Group

Contract Professional Services

Research Triangle Area
4109 Wake Forest Rd.
Suite 307
Raleigh, NC 27609
1-800-222-1273

EDP AUDIT &
DATA SECURITY
POSITIONS
COAST TO COAST
AND OVERSEAS

All positions fee paid.
Also free resume preparation
and career appraisal. Call (203) 421-4071 or
write:

Professional Search
P.O. Box 477
Clinton, CT 06413

PROGRAMMER
ANALYST

Tampa based electric utility has an opening for a Programmer Analyst within the Information Systems department. A bachelor's degree in computer science, business, or the equivalent is preferred. A minimum of three years experience as a programmer analyst is required. Must have experience in the implementation and/or support of a complete application system. Should be proficient in COBOL, MVS, JCL and VSAM. Experience with on-line applications and experience with IDMS is preferred. Excellent benefit package is provided. Please send resume with salary requirements to:



Human Resources Division
Post Office Box 272000
Tampa, Florida 33688-2000

EOE

IDMS ADS/O
NO RESUME
REQUIRED
800-874-9595

NPS

NATIONAL PROGRAMMING SERVICES, INC.
121 EXECUTIVE CENTER DRIVE □ SUITE 240
COLUMBIA, SC 29210 □ TELEPHONE 803-772-9412

Computer

Throughout the world, Cray Research Inc. is synonymous with supercomputers. Why? Because we never stop improving our products, their power, speed, efficiency. The same with our people. We look for individuals with an unusual spark of creativity and talent. A career at Cray is a career of practical problem-solving, in an extraordinary industry, with a company that believes in individuals.

Manager of Automated Support

Our International Software Technical Support interfaces with internal and external customers to analyze, follow through and resolve problems and questions related to Cray software products. We currently seek an individual to lead a group responsible for the development of tools and databases to enhance the worldwide support of Cray software products. This includes problem reporting and tracking, call management and remote support capabilities. Previous project leadership, management and database experience required. Knowledge of artificial intelligence, ORACLE® software and industry experience in support tools implementation a plus.

Sr. Communications Programmer Analysts
Software Test and Evaluation

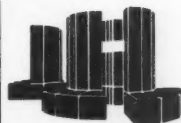
Several exciting positions are available for individuals with a strong background (3-5 years) in UNIX™ based communications systems and protocols. Responsibilities include software testing and evaluation of communications products that link Cray UNICOS systems to IBM/MVS systems and UNIX based workstations. Additional experience with C language, VAX/VMS, IBM networking, TCP/IP, OSI or User interfaces considered a plus.

At Cray Research Inc. your creativity and talent will be rewarded with an excellent compensation plan that includes profit sharing and a highly competitive benefits package. To apply, send your resume in confidence to: Cliff Reykdal, Cray Research Inc., Dept. CW297, 1440 Northland Drive, St. Paul, MN 55120.

Equal Opportunity Employer M/F/H/V

*ORACLE is a trademark of ORACLE Corporation

**UNIX is a registered trademark of AT&T Technologies



CRAY

SENIOR PROGRAMMERS/ANALYSTS
TEAMWORK

That's the #1 priority at CMSI. Management and Consultants pulling together as a unit have made our company an industry leader in providing the highest quality software development service available.

Our commitment to build a staff of technically superior people assures that your work place will be a source of challenge and fulfillment. Also, working with this team of very talented individuals will be an opportunity for you to expand your existing skills and learn new ones.

- | | | |
|------------------|---------------------|-------------------|
| • PACBASE | • IMS DB/DC | • IDMS ADS/O |
| • CICS | • COBOL | • COMETS |
| • DB2 | • UNIX/C | • INFORMIX/C |
| • SYSTEM 38 | • AS/400 | • DEC/VAX |
| • NATURAL/ADABAS | • DATACOM/IDEAL | • MSA |
| • ASI | • INTERACTIVE COBOL | • HONEYWELL DPS 9 |

We are currently seeking application development professionals with two or more years experience in the above listed skills for assignments throughout the USA. Please call or send resume to corporate headquarters c/o Donald L. Thompson, Director of Research, 7948 Baymeadows Way, Suite 160, Jacksonville, FL 32256. 1-800-552-CMSI, FAX 904-737-6376.

Branch Manager, 1640-22 Powers Ferry Road, Marietta, GA 30067, 404-980-2593.

Branch Manager, 12400 Olive Blvd., Ste. 555, St. Louis, MO 63141, 314-275-4465.

Branch Manager, 111 Charter Oak Ave., Hartford, CT 06106, 203-722-1729.



Computer Management Sciences, Inc.

"Computerworld is the only place we advertise."

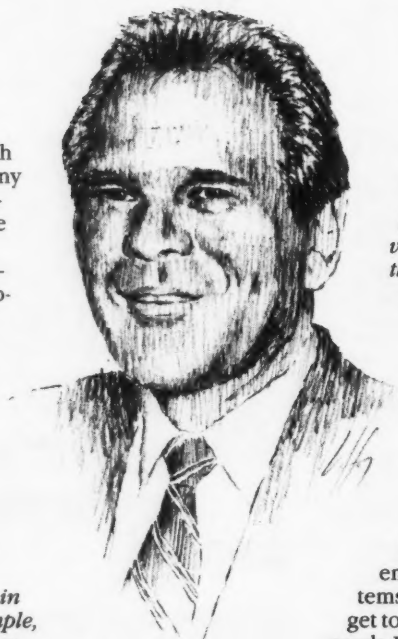
— Peter Jozwik
President
The Search Firm
San Francisco

Peter Jozwik, President of The Search Firm, makes it clear that his company is a recruiting organization, *not* an employment agency. Recruiting firms like his locate qualified personnel to fill their clients' well-defined positions — whereas employment agencies find positions for job seekers.

The big difference, Peter explains, is the networking approach The Search Firm takes. In talking with candidates, he gains a greater understanding of the types of professionals currently in the job market — and whether they match the needs of other Search Firm clients. And to reach these professionals, he turns to *Computerworld*.

"We're looking for name recognition in the computer community. It's that simple, for the most part. We really don't advertise specific positions — just our company and our specialized services.

"And we're particular about where we advertise. Compu-



terworld gives us the audience that's perfect for us. We're reaching all kinds of computer professionals at companies of all sizes in just about every industry. Obviously, if you're a professional recruiter, that's just what the doctor ordered.

"Results? Put it this way: Computerworld is the only place we advertise. And that's a decision that keeps looking better every day. Awhile back we experimented with advertising in other publications — an experiment that proved Computerworld is the only vehicle for us. So for the future, I see no reason to do anything but advertise regularly in Computerworld."

Computerworld. We're helping serious employers and qualified information systems, communications and PC professionals get together in the computer community. Every week. Just ask Peter Jozwik. For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Sales Representative today.



COMPUTERWORLD

The weekly newspaper of record for computer professionals.

Boston: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171
(508) 879-0700

New York: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652
(201) 967-1350

Washington D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031
(703) 573-4115

Chicago: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018
(312) 827-4433

Los Angeles: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714
(714) 250-0164

San Francisco: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714
(415) 322-3314

COMPUTER CAREERS

SILVER EDGE

BUSINESS SYSTEMS, LTD.

SYSTEM/38 EXPERTS

We need your talents! If you have analytical ability, creativity and technical skill, we want to talk to you! Silveredge Business Systems, a growing professional consulting service organization currently specializing in the System/38, is seeking highly-visible, experienced Analysts and Programmers to join our team.

Committed to quality in our management practices, we provide variety, challenge and assured state-of-the-art technology with our own AS/400.

We offer a comprehensive benefit package including health, dental, disability, life insurance, and compensate 1.5 times your normal pay for overtime, plus relocation/bonus fee.

Positions are located in the Chicago area. For confidential consideration, send your resume including salary requirements or call: Sue Beulke at 312-465-7738. Silveredge Business Systems, One Westbrook Center, Suite 300, Westchester, IL 60153. EOE M/F

Software Consultants

ComputerPeople Consulting Services is expanding its professional staff in our Columbus, Ohio office. We have immediate needs for experienced specialists.

Software Engineers

Design and development positions requiring solid experience in VAX, VMS, or UNIX environments. Desired skills include working knowledge of ORACLE, or INFORMIX and experience using structured methodologies, CASE, Tools and relational data base systems. Telephone industry experience is ideal.

Programmer/Analysts

Positions available for VAX, VMS, COBOL and Powerhouse programmers. We are also looking for IBM mainframe programmer analysts experienced in PACBASE and/or TELON application generators.

For immediate consideration please send your resume to Mr. Jeff Miller, ComputerPeople Consulting Services, 50 Northwoods Blvd., Worthington, Ohio 43085. An equal opportunity employer.

ComputerPeople

Committed to the Highest Level of Client Satisfaction

Programmer Analysts

System 38 Massachusetts, New York or Pennsylvania Positions

Give your career the strategic edge with Computer Horizons Corp., one of the top DP consulting firms in the United States, with sales now exceeding \$80 million and a highly successful network of 31 offices around the country. CHC has a firm commitment to create expert solutions for our major Fortune 500 clients. Now is the ideal time to join us as we target new markets and extend our geographic presence in MA, NY and PA.

Currently, we seek several Programmer Analysts with a minimum of 3 years experience in any of the following:

- System 38
- RPG III

If selected, we offer above average salaries, a complete benefits package that includes health, life, dental and disability insurance, unlimited tuition refund, as well as our deferred income savings plan 401K, relocation assistance and the chance to secure your future in an established, growing leader in the technological industry. Please respond by calling or sending resume to:

Roseann Puma
1-800-847-4097 (Outside New York)
212-371-9600 (In New York)



COMPUTER HORIZONS CORP.

747 Third Avenue
New York, N.Y. 10017
An Equal Opportunity Employer M/F

The Time is Right To Talk To GE Consulting



GE Consulting has a lot to talk about. We're a company on the move one with a story we'd like to tell. And we want to make it easy for you to learn more about us and our opportunities. Your career succeeds on the opportunities you've prepared for recognized and responded to.

Our Clients

At GE Consulting Services, our 1500+ professionals work with client systems management, technical experts and users to build systems and solve problems for our impressive client list of America's most prestigious names in the industry, a high-profile, high-growth member of the General Electric corporate family.

Our Opportunities

Immediate openings exist in our NE Regional Office - Albany/Schenectady. Upstate NY, the Adirondack Mountains, the CAPITAL DISTRICT offers affordable suburban living with a closeness to Boston, New York City and Montreal. Our attractive location puts you near breathtaking landscapes, year-round recreation, and is a major center for technology, education and the arts.

Immediate openings exist for individuals with 2+ years in any of the following:

IBM MAINFRAME	MINI/MICRO
IMS/DB/DC, DLI	Honeywell DPS
IDMS ADS/O	DEC VAX
CICS	UNIX C
(COPICS a real plus)	

GE Consulting Services offers substantial opportunity for career advancement, excellent salaries & benefits that include paid medical/dental, life insurance, paid education and training, paid tuition reimbursement & GE product discount.



GE Consulting Services

Lynne Mendelson,
Technical Recruiting Manager
17 Computer Drive West
Albany, NY 12205
(518) 454-2348

PROGRAMMER/ANALYSTS

General Dynamics Data Systems Division provides vital data processing support throughout General Dynamics Corporation. We currently have the following opportunities available in our Norwich and Groton, CT facilities:

TANDEM

The project you will be working on involves a new Document Control Work in Process system with On-line and batch capabilities. Must have 2 years' experience in programming application PATHWAY REQUESTER's and SERVER's as well as experience with the following tools: COBOL, EDIT/TEDIT, ENFORM, INSPECT and TMF. Experience with SNAX/APC (LU6.2) is a plus.

IMS/IDMS

Our Business Systems Development group has several large new development projects underway in Material, Manufacturing and Logistics Applications. Must have 2-5 years' IBM Mainframe/COBOL experience with either IMS or IDMS experience.

In addition to the many opportunities to improve your technical skills, General Dynamics offers competitive salaries and excellent fringe benefits.

Please send your resume (ONLY THOSE WHO PROVIDE CURRENT SALARY INFORMATION WILL BE REVIEWED), to: Human Resources, Drawer 406, P.O. Box 30, Yantic, CT 06389.

GENERAL DYNAMICS

Data Systems Division

Equal Opportunity Employer



Systems professionals can discover career enrichment and personal satisfaction through the rewarding positions available with our prestigious clients. Logical Options and Sanderson Associates have merged forming Northern California's premier Search Firm.

THE SEARCH FIRM, INC.
585 MARKET STREET, SUITE 1000, SAN FRANCISCO, CA 94105
(415) 777-3900 FAX 777-8632

DIRECTOR HOSPITALS MANAGEMENT INFORMATION SYSTEMS

Mercy Medical Center is recruiting for an experienced professional to direct the Hospital Management Information Systems Department (HIMS).

Responsibilities include day-to-day management of the department, strategic planning, policy development, liaison and functional and administrative support of approximately seven departments, technical, educational and support staff.

The successful candidate will have a Bachelor's degree and five (5) years management experience in a comparable-size information systems organization. Additional qualifying experience may be substituted for education. A working understanding of current information systems technologies with particular emphasis in the areas of distributed processing and networking is also required. A working knowledge of business and clinical systems applications in a health care setting is highly desirable. Send cover letter and resume through January 31, 1989, to:

Glenn O'Dell
Human Resources
Mercy Medical Center
1512 12th Avenue Road
Nampa, Idaho 83686
(208) 468-6800
EOE

IMS/DB2

Applications Development
Programmer Analysts
Systems Analysts
Project Leaders
Data Base Analysts
Department Managers

Systems

Programming
MVS/XA Systems
Programmers
IMS and DB2
Systems Programmers
CICS Systems
Programmers
VTAM/NCP
Systems Programmers
VM Systems
Programmers
DOS/VS
Systems Programmers

CREST

COMPUTER CAREERS
4067 Hardwick St.,
Suite 142
Lakewood, CA 90712
(213) 493-1270

CASE

Leading CASE vendor is seeking SR. CONSULTANTS to join their Information Engineering Consulting Practice. Positions available for offices in WASH. DC, NYC/NJ, CALIF., CHG. & CANADA. Requirements include a min. 5 yrs. exp. BS (MS pref.) & MIS knowledge including:

- Structured Methodologies
- IBM MVS, CICS, DBMS, PC's, COBOL, R/L, Large Systems
- Data/Proc. Modeling, Info. Eng.
- Proj. Mgt., Client Relations
- Ability to travel 50-60%

Company offers excellent advancement opportunity, compensation/bonus package & superior training program. Please fax resumes (703) 358-2933 in confidence or call (703) 358-2980. Halbrecht & Company, ATTN: KURT CASE, 10195 Main St., Ste. L, Fairfax, VA 22031

HALBRECHT & Company
Your #1 CASE Recruiter

STRUCTURED LOGIC SYSTEMS INC.

Two Penn Plaza, Suite 1540
New York, NY 10012
1-800-537-1152, 212-947-7510

Immediate need for per diem consultants and permanent employees for work on state-of-the-art developments for Fortune 500 clients in California, Massachusetts, Connecticut, New York, New Jersey, Washington, DC, Georgia and Texas.

We need candidates with the following, all levels:

INTERNAL TESTING	COMPILER DEVELOPMENT
APPLICATIONS	SUN WORKSTATIONS
X/MS WINDOWS	COMMUNICATIONS
	SYSTEM ADMIN.

Other positions also available. Excellent daily rates or salaries. Please call or send resume to:

Structured Logic Systems Inc.
Two Penn Plaza, Suite 1540
New York, NY 10012
1-800-537-1152, 212-947-7510

DIRECTOR, SYSTEMS DEVELOPMENT RETAIL

Directs MIS staff of approximately 65 professionals in the development, implementation and maintenance of systems for a leading Southeast fashion retailing organization in a state-of-the-art IBM environment. Systems responsibilities include:

- Inventory Management
- Merchandise Acquisition and Distribution
- Finance
- Credit

Ideal candidate will have experience with merchandise systems and be a business oriented manager. Must have hands-on experience in:

- complex on-line integrated systems
- project and people management
- extremely strong interpersonal skills

Position offers opportunity for growth plus excellent "quality of life" in the Sunbelt.

Call Chuck Imhoff at (704) 357-1000, Ext. 3804 or send resume to: Charles M. Imhoff, Bank Stores Service, 2801 West Tynola Road, Charlotte, NC 28217-4500

SR. SOFTWARE ENGINEERS

all positions involve NEW software development 2 to 8 years experience required

OPTIONAL/FUTURE trading software (UNIX, C) Mathematicians for OPTIONS/FUTURES quant research WINDOWING Software (C on MAC or PS2) Experienced Software Development Managers UNIX Administrators and Kernel Specialists CASE/CAE software (C++, SUN, APOLLO) UNIX SYSTEM V (Boulder Background) MACINTOSH software (C or PASCAL) TELECOMMUNICATIONS specialists CONSULTING or PRE-SALES (INFOCAMP or ORACLE) MILITARY (ADA or UNIX/C)

UNITECH

676 N St Clair - Suite 1900
Chicago, IL 60611

PROGRAMMERS

Contract Assignments \$25-30 Per Hr.

Jr. to Sr. level programmers with 1+ yrs. exp. in IBM & other languages (PASCAL, C, ASSEMBLER PL-1, etc.). Contract assignments 12 mos. + \$25-30/hr. + benefits package. In confidence, contact Al Hansen, CEC.

CORPORATE PERSONNEL CONSULTANTS, INC.
3705 Larkin Drive, Suite 318
Charlotte, NC 28211
(704) 386-1888

JANUARY 23, 1989

MARKETPLACE

PC expenses can mount quickly

Personal computer buyers get caught off-guard by unexpected costs

BY JOHN J. XENAKIS
SPECIAL TO CW

"Complete 20-megabyte hard disk system," reads the advertisement. "IBM compatible, \$1,095 includes monitor and free word processor." It sounds pretty good. Add another \$200 or \$300 for a dot matrix printer, spare floppy disks and printer paper, and you are all set.

Not necessarily. The fact is, when you install personal computers, you are liable to be very surprised at some of the follow-on expenses. Take printers, for example.

"One thing people overlook is the cost of a good printer," says Michael Ferrier, vice-president at Airline Tariff Publishers in Washington, D.C. "When they start looking, they plan on a cheap dot matrix printer but then get surprised when they decide they have to have a letter-quality, 24-pin, wide-carriage printer."

Or more. One purchaser of an IBM Personal Computer AT-compatible hoped to use it in his tax preparation business but balked when he learned that his software required a laser printer. That piece of equipment can easily cost more than the computer itself, but because it can

print both Internal Revenue Service forms and data, it will save an enormous amount of time by avoiding the need to feed in the forms.

Jim Stone at White Swan, Inc., a wholesale food distributor in Fort Worth, Texas, provides some general advice. "In the very beginning, define a strategy for the use of PCs within the company," Stone says. "Develop corporate PC strategies to prevent, as best you can, each individual going off on his own and securing PCs and software."

Repairs cost money

Maintenance is a common source of expense for PC users. Edward Wyatt, director of the Computer Center at Equitable Life Assurance Society of the United States, also in Fort Worth, takes a cut-and-dried attitude toward the issue.

"Our computers have been so reliable that we simply replace or fix what's broken, and we don't keep a standard maintenance agreement on our PCs," he says.

But this approach can lead to trouble. "When we were using a time-and-materials maintenance method, one of our PCs once had to have a board replaced, and that cost \$750," says Robert

Knepp, general manager of Blue Cross Shared Services Center in Lemoyne Pa. "Now they're on regular maintenance, and that sort of thing is covered."

For people who decide to get maintenance contracts, there are several types:

THE FACT is, when you install personal computers, you are liable to be very surprised at some of the follow-on expenses.

• **On-site maintenance.** A service person comes to your office and performs the repairs there or leaves a loaner if the repairs will require more time. The repair service may guarantee turnaround in four, eight, 24 or 48 hours, or it may offer different options at different prices.

• **Depot maintenance.** You take the computer to the service shop and pick it up when it is repaired.

• **Pickup and delivery.** This method falls between the other two in terms of convenience. Maintenance is done at a depot, but someone else takes the computer back and forth.

Depot maintenance can get complicated. If a system has a

printer problem, for example, you need to take both the printer and the computer to the repair shop unless you are sure where the problem is. On the other hand, on-site maintenance can run from \$400 to \$1,000 per year per system, depending on system size and complexity.

The need to upgrade might provide another unanticipated expense. "Because software packages change so much, if you don't have the newest PC in the

world, you might have a problem running the latest software. And it's costly to upgrade a machine," notes Lois Brooks, an accountant at Creative Property Management Co. in Cedar Rapids, Iowa.

But wait, there's more

Training can provide another expense. However, it seems to be a cost that some people overestimate; TV commercials for Macintoshes indicate that training on IBM PCs and compatibles costs a fortune, but some users say otherwise.

"We've been sending people to classes at the dealer," Airline Tariff's Ferrier says. "These courses are very inexpensive,

something like \$99."

Richard Brooks, corporate production executive at Banks of Iowa Computational Services, Inc., keeps training costs down a different way. "We use the PCs themselves to train people," he says. "We have a bunch of computer-based training software packages we run on the PCs."

Indeed, Brooks emphasizes the role of the PC as a money saver.

"PCs are kind of like workhorses for us," he says. "They actually in some cases take the role of a human being because they do rudimentary tasks that a human would have to do. So it winds up being cheaper to put a PC in here than it is to hire a person."

Xenakis is a computer columnist for *The Boston Globe*, software editor of the Boston Computer Society's *Computer Update* magazine and host of a weekly radio show.

Index

Marketplace	107
Used/Lease/Rent	107
Hardware	111
Software	111
Graphics/Desktop Pub	111
Time/Services	112
Bids/Proposals/Real Estate	111
Business Opportunities	111
Training	113

The BoCoEx index on used computers

Closing prices report for the week ending Jan. 13, 1989

	Closing price	Recent high	Recent low
IBM PC Model 076	\$650	\$750	\$400
XT Model 086	\$1,150	\$1,250	\$900
XT Model 089	\$1,225	\$1,575	\$1,050
AT Model 099	\$1,675	\$2,400	\$1,525
AT Model 239	\$1,925	\$2,900	\$1,800
AT Model 339	\$2,000	\$3,600	\$1,800
PS/2 Model 30	\$1,500	\$1,700	\$1,300
PS/2 Model 50	\$2,325	\$2,600	\$1,900
Compaq Portable I	\$650	\$975	\$600
Portable II	\$1,650	\$2,000	\$1,650
Portable III	\$2,900	\$3,175	\$2,500
Portable 286	\$1,750	\$1,975	\$1,675
Plus	\$1,150	\$1,250	\$900
Deskpro 286	\$2,200	\$2,350	\$1,800
Deskpro 386	\$3,800	\$3,975	\$3,675
Apple Macintosh 512	\$675	\$950	\$550
512E	\$850	\$1,025	\$600
Plus	\$1,000	\$1,200	\$900
II	\$4,200	\$5,100	\$3,800
NEC Multispeed	\$800	\$850	\$700
Toshiba T3100	\$2,200	\$2,500	\$2,000

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

Used/Lease/Rent

IBM
BUY • SELL • LEASE
CDLR

WE RENT AS/400's

SHORT OR LONG TERM

S/1 S/3X
PARTS POS

AMCOM
CORPORATION

800-328-7723

612-829-7445
5555 WEST 78TH STREET
MINNEAPOLIS, MN 55435

FOR SALE

IBM 38-90
doc proc

Available Immediately

Targa
Financial, Inc.

(612) 473-2000

FOR SALE NEW AS/400's

All Models

Terminals, Printers, Disk Drives

3196, 3197, 4224, 4234, 9332, 9335

IMMEDIATE DELIVERY

Call Paul Britton

RALION SYSTEMS, INC.



10 Sasco Hill Road
Fairfield, CT 06430
(203) 255-5968

LaSalle Computer Corporation

T-BAR SWITCH
12x12

Available Now

For Sale or Lease

For more information

Call Betsy Shields

312-967-1750

CDLR

IBM

5/26 3862-021, w/5mb Main Memory
4 Conns. Insys, Support 84

Local W/2's, 1 int. 42 pc.

Disk Drive, Ctr. R6.0 Op. Sys.

3370 DAIS Model A11-571.3mb

w/Built-in controller

Model B121 (3), w/725.3mb on

TOTAL DAIS CAPACITY 2836.3mb

3282 Printer Model B01, 650 LPM

3411 Tape Mtd 003, 500ba Data Transfer

at 1800 tape tape density

Direct Sale via Sealed Bid,

estimate date mid-February 1989

Call for Bid Documents

or Information

METRO-DADE COUNTY, Miami, FL

Contact: T. Rudolph (305) 594-5768

Used/Lease/Rent

IBM SYSTEM AS/400

4300

SERIES 1

MEMBER OF **WAL**

MEMBER OF **CDIA**

*SPECIAL LEASE RATES ON NEW AS/400's

- Buy • Sell • Lease • Trade • New • Used
- IBM Warranty/IBM Maintenance Guaranteed
- Disk • Terminals
- Flexible Lease Options Tailored to Your Needs
- Printers • Tape

Equipment Configured To Your Requirements

All CPU Upgrades

NEWPORT LEASING, INC.

800-6789-IBM

2 Faraday,
Irvine, CA 92718
714/770-2122
FAX: 714/770-5441

PRIME

EXPERIENCED
SYSTEMS AND
PERIPHERALS

BUY-SELL-LEASE-BROKERAGE

NEW PLUG-COMPATIBLE
DISK, TAPE, MEMORY

PLUS

**THE FASTEST I/O
AVAILABLE ANYWHERE**

1ST SOLUTIONS, INC
11460 N CAVE CREEK ROAD
PHOENIX, AZ 85020
602-997-0997
ASK FOR DON SHIFRIS

RT

937X

Series/1

AS/400

System 36, 38

4300

Buy, Sell, Lease, Rent

612-942-9830

All IBM Machines and Parts

DATATREND, Inc.

10250 Valley View Road
Suite 149
Eden Prairie, Minnesota 55344

**BUY OR SELL
NEW OR USED**

IBM PC * XT * AT * PS/2
COMPAQ * HP * AT&T * WANG
MACINTOSH * APPLE 2

1-800-262-6399

**Boston
Computer
Exchange
Corporation**

MA 617-542-4414
FAX 617-542-8849

WANTED

**OBSOLETE
AND EXCESS
COMPUTER
EQUIPMENT**

Top Cash Paid

We purchase all types of obsolete or excess computer equipment and peripherals. We pay costs for all shipments as well as top prices.

Call today for a quote on your system.

COMPU-SCRAP, Inc.
Randolph, MA 02368
(617) 341-2695
Call Collect!

VAX RENTALS

**MV 3500/3600
MICROVAX II
VAX 6000 SERIES
VAX 8000 SERIES
Systems & Peripherals**

- Fast Turnaround
- Dependable Products
- Upgrade/Add-On Flexibility

6 Months • 12 Months • 36 Months

BROOKVALE ASSOCIATES
dtd Digital Dealers Association

(516) 273-7777 • (206) 392-9878

**BURROUGHS
UNISYS**

B20 - B7000

A Series - V Series

All Peripherals

Low Lease Rates

Depot Maintenance

LDI/
COMPUTER PROVISIONS
CORPORATION

(216) 687-0307

**We Buy & Sell
DEC
Systems
Components**

**call: 713
445-0082**

Digital Computer Resale

800 Kenick, Ste C22
Houston, Tx 77000

\$ SAVE \$

**IBM
DISPLAYWRITERS
AS/400**

36's, 38's, 4300's

IBM compatible printers

* IBM * DEC * WANG * XEROX

Printers, Terminals, CPU's & DISKS

LRK RESOURCES UNLTD INC.

713-437-7379
FAX 713 437-4945 800-523-8903

**NEW
IBM 9370**

9375 Central processor IBM
(4) 9335 disk drives (B) - 3 gigabytes
(2) 9335 disk controllers (A)
(2) 9309 racks (CPU and disk)
4245 printer - 2000 LPI
(5) 3250 terminal multi plexor
(36) 3191 CRT terminals
(2) 3420 tape drives
3803 tape controller

Under IBM Maintenance
Available Immediately
(404) 955-5525

FOR SALE

FRONT-END PROCESSOR

**NCR COMTEN
MODEL 3695**

- 2MB MEMORY
- 40 LINES, CONSOLE, HARD DRIVE

3725 COMPATIBLE,
WITH MORE POWER

Contact Fred Willis
(213) 446-6309

**You Have 10 Ways To
Advertise Your Products In
The MARKETPLACE**

**It's Computerworld's Product
Classified MARKETPLACE**

Featuring:

- | | |
|---|--|
| <input type="checkbox"/> Training | <input type="checkbox"/> Communications |
| <input type="checkbox"/> Used/Lease/Rent | <input type="checkbox"/> Business Opportunities |
| <input type="checkbox"/> Hardware | <input type="checkbox"/> Bids/Proposals/Real Estate |
| <input type="checkbox"/> Software | <input type="checkbox"/> Time/Services |
| <input type="checkbox"/> Peripherals/Supplies | <input type="checkbox"/> Graphics/Desktop Publishing |

**Reach over 612,000 Information Systems Professionals
by placing your ad in the MARKETPLACE.**

Name: _____

Title: _____

Company: _____

Address: _____

City: _____

State: _____ Zip: _____

☐ I am enclosing ad material with this form.

Ad size: _____ columns wide x _____ inches deep.

Return this form and advertising material to:

**Computerworld Product Classified
Marketplace**

**375 Cochituate Road, Box 9171
Framingham, MA 01701-9171**

(508) 879-0700

**COMPUTERWORLD
CLASSIFIED MARKETPLACE**

Where all computer buyers and sellers can go to market.

Used/Lease/Rent

WANT TO BUY

3720'S • 3725'S

FOR SALE

3720's • 3725's • 3745's

DDC

Communication Controller Specialists

Distinctive Dataprocessing Consultants, Inc.

Call us for a quote on your
features, upgrades, and line sets!

(214) 869-2214

FAX 214-869-1589

FOR SALE BY END USER
HP 1000

Equipment	Installed	Qty.
HEWLETT PACKARD 1000 "E" SERIES	7/83	1
5402 Processor		
1.1 M.B. Memory	7/83	2
HP 7925 120 MB Disk Drive	7/83	1
HP 7906 20 MB Disk Drive	7/83	1
HP 2621 Screen	7/83	4
HP 2645 A Screen	7/83	1
HP 2623 Screen	1/84	1
HP 2631B Printer 180 cps	7/83	3

Contact: NATIONAL PETROLEUM CONSTRUCTION COMPANY
ABU DHABI U.A.E.
Procurement Superintendent
Tel. no. 23807 NPCC EW
Fax no. (009712) 578-185

Reconditioned
digitalTM
Equipment

Whatever your requirements are for
Digital Equipment, call CSI first! Buying,
selling, trading, leasing, consignments -
we do it all!

CSI sells all equipment with a 30
day unconditional guarantee on parts
and labor and is **eligible for DEC
maintenance.**

Offering systems, disk drives, tape
drives, printers, terminals, memory, op-
tions, boards, upgrades and many
more.



Compu Systems, Inc.
75 Tessa Dr. Stoughton, MA 02072
CALL TOLL-FREE 1-800-425-5499
In Mass. (617) 344-9800
FAX (617) 344-4199

HP 3000

ATP's • S/70
7937H • 7933H

Available in Quantity

Processors • Peripherals
Systems

All In Stock - Immediate Delivery

All warranted to qualify for
manufacturer's maintenanceBUY • SELL • TRADE
RENT • LEASE

ConAm Corporation

It's Performance That Counts!
800/643-4954 213/829-2277Educate your
customers through
Computerworld
Marketplace's
training section.

For more information, call 800/343-6474 (in MA,
508/879-0700).

COMPUTERWORLD
CLASSIFIED MARKETPLACE

Where all computer buyers and sellers can go to market.

IBM

BUY • SELL • LEASE

CDIA

SYSTEM
36/38
SERIES
1SYSTEM
36/38

AS/400

43XX
30XXAT&T
VOICE
SYSTEMS

- Processors
- Peripherals
- Upgrades

DEMPSEY

ASSOCIATES

18377 Beach Blvd., Suite 323
Huntington Beach, CA 92648 (714) 847-8486

(800) 888-2000

HONEYWELL

LEVEL 6 DPS 6 SERIES 16

- Complete Minicomputer Line
New & Used
- All Peripherals and Terminals
- Upgrades and Features
- Depot Repair Capability
- Honeywell Maintenance
Guaranteed
- Immediate Delivery
Low Prices
- HDS 5 and HDS 7
Compatible Terminals

The Recognized Leader
in Honeywell Minicomputer
Sales and Support

BOS

BOUDREAU COMPUTER SERVICES
100 Bearfoot Road,
Northboro, MA 01532
(508) 393-6839
FAX 508-393-3781

IBM Unit Record
EquipmentData Modules/Disk Packs
Magnetic Tape/Diskettes

029-082-083-084-085-088
129-514-519-548-557-188

2316-3336(1)&(11)-3348(70)
80-200-300 MB
Disk Packs

Thomas Computer Corp.
8638 W. Howard Chicago IL 60648
800-621-3906 312-647-0880

SAVE UP TO 50% ON
WANG. Get a bang
for your buck.
Buy WANG from us!

NORCOMEX LTD.
Second User Equipment
34 Futurity Gate, Unit 17
Concord, Ont. Canada L4K1B8

OVERSEAS INQUIRIES CALL COLLECT
(416) 736-0803 (416) 736-1089
TELEX 06-060391 TOR. FAX (416) 736-0613

We buy, sell, lease & rent
quality new and used equipment.
And we stand behind it for a year.

digital

SA482-AA
(New) 2.488 GB
Storage Array
\$52,000.00

LP25-AA
285 LPM Band
Printer
\$595.00
LP25-BA
285/204 LPM
64/96 Character
Band Printer
\$695.00

RA81-AA
456 MB
Winchester
Disk Drive
\$5,995.00

Long and Short
Term Leases
and Rentals
Available
CALL...

DV-350-T1-AA
MV 3500
\$72,500.00
DV-360-T1-AA
MV 3600
\$ 98,200.00

We Pay Cash
for New, Used
and Obsolete
Surplus DEC
Equipment

Wanted
Sun
Microsystem
Computer
Equipment, any
System, any
Configuration

RA82-AA
622 MB
Winchester
Disk Drive
\$12,395.00

PDP 11/23
11/24
11/73
11/83
11/84
All Configured
to Your
Needs....

TRIDEX
CORPORATION

Phone: 603-886-0383
Fax: 603-886-0914

375A WEST HOLLIS ST. NASHUA, NH 03061

Associates Inc.

- Data General • Fujitsu
- Data Products • CDC
- Printronix • Zetaco

BUY SELL TRADE

(617) 982-9664

FAX: (617) 671-4456

DEC VAX & AT&T
BUY-SELL-NEW-USED

Systems, Peripherals, Options
available for sale

Looking to purchase VAX
and AT&T Systems, Hardware

LAKEWOOD COMPUTER
CORP.

438 Link Lane

PL Collins, CO 80524

(303) 493-8406 FAX: (303) 493-6400

ada

Used/Lease/Rent

CALL US LAST

GET YOUR BEST PRICE
Then Call

SPECTRA PRODUCTS, INC.

For The Best DEAL

WE

Buy - Sell - Lease - Rent

IBM and DEC™ SYSTEMS

NEW and USED

Other Services Available

Installation and Maintenance

Contract Programming

Call 800-238-8405
IN TN 901-754-6500



SPECTRA PRODUCTS, INC.
1669 KIRBY PKWY. MEMPHIS, TN 38119

"SINCE 1974"

Formerly Computer Brokers, Inc.

IBM SPECIALISTS

SELL • LEASE • BUY
S/34 S/36 S/38 AS/400
3741 3742

- New and Used
- All Peripherals
- Upgrades and Features
- IBM Maintenance Guaranteed
- Immediate Delivery
- Completely Refurbished

800-251-2670

IN TENNESSEE (615) 847-4031



PO BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

minicomputer exchange

since 1973

**BUY • SELL
BROKER • SERVICE**



**DEC
DG**

Computers • Systems
Peripherals

CAD/CAE Equipment

Call 408-733-4400

FAX: 408-733-8008

**BUY, SELL
LEASE
IBM CPU's**

3081's, 3083's,
3084-QXX, 3090
PILLAR SILENT BLOCK,
PARALLEL CABINET

GTEX Financial Group
(214) 783-1212

CDLA

Est. 1978

**CAD STATION
\$9,995**

**The Tektronix 4125
Color Graphics
Terminal**

Reconditioned Products: Our demo
and lease returns are restored to latest
specifications and are available with a
variety of options.

These products carry Tek's full warranty.

For purchasing or leasing
information, call

1-800-TEK-6100

Tektronix

COMMITTED TO EXCELLENCE

GWD-117

**DEC - IBM
BUY / SELL**

VAXs
MICROVAX II, III SYSTEMS
PERIPHERALS
IBM XT, AT
ALL MICROS
IN STOCK

IBM AT 339s (New & Refurb)
IBM 3174 51Rs (New & Refurb)
ALL KEY, PBX & Telecom EQPT.

LINK PROCESSOR

603 E. Town St.
Columbus, OH 43215
Phone: 614-461-1638
FAX: 614-239-8386

DEC POP-11
SYSTEMS & PERIPHERALS



**THE
One-Stop
EXCHANGE!**

• CPUS • TERMINALS
• DISC DRIVES • PRINTERS
• INTERFACES, ETC.

**dce DIGITAL
COMPUTER
EXCHANGE INC.**
2773 Industrial Blvd., Hayward, CA 94545
FAX (415) 887-6860 TEL 708428

Call (415) 887-3100

IBM S/38

Model 700 - 32 Meg

4 Work Station Controllers

8 Communications lines

Specifications available on request

NO BROKERS

End user inquiries only

Call Mike Barkalow

Thompson Tractor Co.

(205) 841-8601

FAX: (205) 848-4287

**COMPUTERWORLD's
Product Classified
MARKETPLACE**

Examines the issues while
Computer Professionals
examine your message.
Call for all the details.

East

(508) 620-7784

West

(508) 620-7759

Midwest

(508) 620-7758

WANT TO SELL

IBM 3081

Model K32

IBM 3082

Model 24

IBM 3087

Coolant Distrib. Unit

IBM 3278

Display Console

Available Jan 31, 1989

Price Negotiable

Call NOW

Jim Shaffer

405-943-8002

PARADYNE MODEMS

For Sale

MPX - 4800

(quan. avail. - 780)

PDN - 3430

(quan. avail. - 230)

Upgradable to 9600 Band

Modems have diagnostic card and
DCAA dial backup feature

Garry Cloyd

Norwest Financial

(515) 247-7339

• Buy • Sell • Lease • Rent

IBM Displaywriters

5525 -- OFFICE SYSTEMS

5219 -- 5253 -- 5258

6670 PRINTERS

SYSTEM/34/36

CDB FINANCIAL INC

3520 DILDO ROAD

DALLAS, TEXAS 75228

800-648-6791

214-324-1491

Member CDLA

Get Into the Market...

Computerworld's

Product Classified

MARKETPLACE

Reach Over 612,000

Information Systems

Professionals!

Call for all the details

(508) 620-7759

(508) 620-7784

(508) 620-7758

**Your used
computer equipment
deserves a second
chance.**

If you have used computer equipment to sell, *Computerworld's* product classified Marketplace is the best place to do your selling. That's because Marketplace features a Used Equipment section to help you market your equipment to the very people who are looking to buy. And when you advertise in *Computerworld Marketplace*, you reach a total (ABC-audited) audience of over 612,000 computer professionals who turn to *Computerworld* for news, information, features — and Marketplace — every week.

So give your used computer equipment a second chance today. Call 800/343-6474 (in MA, 508/879-0700) to reserve your space.

**COMPUTERWORLD
CLASSIFIED MARKETPLACE**

Where all computer buyers and sellers can go to market.

Time/Services

**ON-LINE WITH
COMPUSOURCE**

- ▲ Multiple centers
- ▲ MVS, VM, DOS
- ▲ RACF, CICS, IMS
- ▲ Decision support software including SAS
- ▲ Volume and term discounts
- ▲ Worldwide access
- ▲ Full technical support
- ▲ Laser printing
- ▲ Disaster recovery services

COMPUSOURCE
(919) 469-3325

Yes, there still is

**DEC-20
TIMESHARING**

LANDART SYSTEMS INC
65 Broadway
New York, NY 10006
(212) 363-3170

**MIS
SUCCESS WITHOUT
STRESS**

**NATIONWIDE REMOTE
COMPUTING SERVICES**

- Fixed Price Computing
- Remote Facilities Management
- General Time-sharing Services
- Image/Forms Design and Laser Printing
- Integrated Financial Applications
- Major Third Party Software Packages
- Micro/Mainframe Applications
- Nationwide Network
- Operating System Conversions
- Overflow Processing

DATA CENTERS:
Boston, MA
Los Angeles, CA
Washington, DC

CALL 1 800 PLAN LCS
1 800 752-6527

Litton
Computer Services

NEW!

**IBM MVS-ESA
Test and
Development
Center**

- IBM 3090/300E - PR/SM
- IBM 3090/120E - Standalone
- Destructive Testing
- Major Databases - DB2, IMS
- Worldwide Network
- Early Release Site

**Remote Computing
Services
24 Hours/
7 days a Week**

- Dual 3090s - MVS/XA, VM/XA
- DEC-VAX, Wang/VS, HP3000
- Extensive Software Available
- Application Pricing
- Cost Effective

INET

**INFORMATION NETWORK
CORPORATION**

For More Information And
Pricing Call
1-800-222-1590, Ext 372

COMPUTING SERVICES

**MVS/XA VM/370
DOS/VSE CICS
TSO CMS
DB2 IMS/DBDC
4GL SAS**

**MULTIPLE CPUs -
50+ MIPS**

TELENET, TYMNET

**IBM INFORMATION
NETWORK**

**DEDICATED
SYSTEMS
AVAILABLE**

GIS

INFORMATION SYSTEMS, INC.

815 COMMERCE DRIVE
OAK BROOK, IL 60521

312-574-3636

**COST-EFFECTIVE
COMPUTING
SERVICES for
TODAY and ...
TOMORROW**

**OUR
MODERN
DATA CENTER**
provides you with
low-cost, state-of-
the-art computing
services.

- IBM* CPUs and Peripherals
- Systems Software: MVS/XA, TSO/E, ISPF/PDF, CICS, VM/XA, VM/SP, HPO, CMS
- Application Software: Database Management, Application Development, 4/GLs, Statistical Analysis, Graphics
- Multiple Communications Methods
- Technical Support
- Pricing to fit your needs

IBM is a registered trademark of International Business Machines Corporation

For more information
Call Jeff Daum
201-896-2030

Or Write
Jeff Daum,
Vice-President
P.O. Box 26
Carlstadt, NJ 07072

**Reach over 612,000 more customers
every week in Computerworld's
Marketplace**

Computerworld's product classified Marketplace lets you market your products and services to Computerworld's total (ABC-audited) audience of over 612,000 computer professionals every week.

Related editorial for drawing readers

Customers are also attracted to Marketplace by articles on computer training and market trends. Plus there's a Closing Prices Report on new and used equipment and Fair Market Value, a statistical summary from International Data Corporation.

Free typesetting and ad creation

Choose "display" or "set-solid" formats for your Marketplace ad - then let Computerworld create and typeset it for you free of charge.

Telecopier service

Send your ad materials to Computerworld in seconds with our telecopier service. The toll-free number is (800) 343-6474 ext. 739/740. In Mass., (508) 620-7739/7740.

**Call your Marketplace sales representative today
to reserve your space.**

East: Paul Bonarrigo, Account Manager
(508) 620-7784

Midwest: Marie Keyes, Account Manager
(508) 620-7758

West: Karen Massimino, Account Manager
(508) 620-7759

**COMPUTERWORLD
CLASSIFIED MARKETPLACE**

Where all computer buyers and sellers can go to market.

**Full-Service
Remote Computing
With a Difference**

Let us be your data center. And get high-quality computing service that can make a big difference in your bottom line. All from MCH Computer Services.

Full IBM compatibility:

MVS/XA JES2 IMS/DC
VM/XA IDMS/R
CICS/VS DB2
ROSCOE QMF
TSO/E PROFS

We also have the latest programmer productivity aids: FILE-AID, DBUG-AID, CICS PLAYBACK and CICS ABEND-AID to name a few.

We provide state-of-the-art systems, software and security for major clients across the country. And we deliver high-quality, cost-effective services that include:

- Laser and high-speed custom (advanced function) printing
- Mail insertion

For more information, call:

1-800-521-0444

MCH Computer Services
5225 Auto Club Drive
Dearborn, MI 48126

**NEW AND USED
RAISED
FOORING**

**Immediate Delivery
Quality Installation**

Raised Computer Floors
One Charles Street
Westwood, NJ 07675
(201) 666-8200
FAX (201) 666-3743

The Computerworld
MARKETPLACE
Reach Over 612,000
Computer Professionals
When They Reach For
COMPUTERWORLD!
(508) 620-7758 (508) 620-7759
(508) 620-7764



Innovative Computer Techniques

COMPUTER SERVICES

IBM 3084

- Batch Processing • Public Network Access

- Timesharing • Laser Printing

Rte 202, Raritan, N.J. 08869

201-685-3400

Contact: Joyce Bogasenko

**370/BAL → C
APPRENTICE**

**Convert your 360-370
Assembler source code
to C or Pascal with our
BAL/C Apprentice**

SymbTech
(508) 460-0335

Bids/Proposals/Real Estate

**MOVING YOUR
OPERATION
TO NEW YORK?** THEN
**CONSIDER
THIS
MOVE-IN SPACE.**

**330
Seventh
Avenue**
at Penn Station

5,250 Square feet that's all set to go, down to the raised floor and double Halon fire protection system! Included are IBM Systems 34 terminals, printers and processors, as well as all furnishings. For full details on the terms of this below market sublet, please call:

Barbara Yogoda, VP (212) 512-9541
Howard Klau, VP (212) 512-9517

NEWMARK

1501 Broadway,
New York, NY 10036

MISSISSIPPI CENTRAL

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

Request for Proposal No. 1458, due Thursday, February 16, 1989 at 3:30 p.m. for the acquisition of a microcomputer based application software package and supporting OMR data capture hardware to establish automation of statewide emergency medical services ambulance run reporting for the MISSISSIPPI DEPARTMENT OF HEALTH. Charge \$10.00.

Request for Proposal No. 1480, due Friday, February 3, 1989 at 3:30 p.m. for the acquisition of an aviation management software package for an IBM PS/2 Model 50 microcomputer running DOS for the STATE AVIATION DEPARTMENT.

Detailed specifications may be obtained free of charge from the CDPA office or at the specified cost by submitting a written request accompanied by the appropriate payment.

NOTE: Valid forms of payment are corporate check or a Mississippi bank, certified check or POSTAL money order. NO CASH OR OUT-OF-STATE CHECKS. The CDPA reserves the right to reject any and all bids and proposals and to waive irregularities.

Patsy Stanley @ (601) 359-2904

**The City of Springfield, Oregon
Request for Proposal
CASE TOOLS**

The City of Springfield is seeking proposals for integrated CASE tools which will support life cycle technology, including prototyping Aids, design tools, project management and application generation software for the Digital Equipment Corporation (DEC) VAX host computer system. Copies of the request for proposal may be obtained from Gene Tracy at the City of Springfield, 225 5th Street, Springfield, Oregon 97477 or by phoning Mr. Tracy at (503) 726-3770.

The deadline for the receipt of proposals is 1 p.m. DST on 2/6/89. Further details of the specifications and proposal submission may be found within the request for proposal.

**FREE ad creation
and typesetting
for your
Computerworld
Marketplace ad.**

For complete details.

Call Cindy Delany,
Operations Manager,
800-343-6474, ext. 719
(in Massachusetts),
508-879-0700, ext. 719

**NOTICE OF INVITATION
FOR PROPOSALS**

The City of Eau Claire, Wisconsin, will receive step one proposals in the office of the City Purchasing Agent at 203 South Farwell Street until 4:00 p.m. Central Time on March 15, 1989 for Procurement No. 8636, Financial Accounting, Payroll, and Purchasing Software. HP 3000 Environment.

All forms and documents related to this notice and the procurement it describes are on file and available from the office of the Purchasing Agent, 203 South Farwell Street, Eau Claire, WI 54602-5148. Telephone 715/839-4916.

James W. Fering
Purchasing Agent

Business Opportunities

**COMPUTER TAPE
CERTIFICATION**

LOCATION	PRICE PER TAPE
Western States	\$3.50
All Other States	\$4.00

We specialize in computer tape cleaning & certification. Our price includes all UPS freight charges, so we will reimburse you for shipping costs incurred in sending us the tapes & return them to you within one day at our expense. Terms are net 30.

PHOENIX COMPUTER SERVICE
8949 Reseda Blvd., Unit 107
Northridge, CA 91324

(800) 727-TAPE

**READ ALL
ABOUT IT!**

- Closing Prices on New & Used Equipment
- Fair Market Value Data
- Computer and Software Training
- Computerworld MARKETPLACE

MidWest
(508) 620-7758
West
(508) 620-7759
East
(508) 620-7784

**COMPUTERWORLD
CLASSIFIED MARKETPLACE**

Where all computer buyers and sellers can go to market

386

**The Fastest 286 & 386
Systems on Earth!**
Only Limited Quantity
Available

286/12 Mhz w/ 0K	\$220.00
286/16-20 Mhz w/ 0K	\$450.00
386/16 Mhz w/ 0K	\$940.00
386/20 Mhz w/ 0K	\$1200.00
386/25 Mhz w/ 0K	Call

(805) 964-3535



HiTech Materials

**It's the
Computerworld
MARKETPLACE**

Reach Information
Systems Professionals
Where They Shop For:

- ☐ Used/Lease/Rent
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunities
- ☐ Training

CALL NOW

(508) 879-0700

**COMPUTERWORLD
CLASSIFIED MARKETPLACE**

Where all computer buyers and sellers can go to market

Hardware

FOR SALE!

**12MHz AT Systems
(starting at \$1295.00)**

**20MHz 386 Systems
(starting at \$2495.00)**

Call
NCC
(508) 820-0335

**BUY SELL
LEASE
DEC/VAX**

CALL
LDI/
COMPUTER
PROVISIONS
Lou Vascek
(216) 687-0307

Software

FREE BUYER'S GUIDE

When you need programmer's development tools, Programmer's Connection is your best one-stop source. We are an independent dealer representing more than 300 manufacturers with over 800 software products for IBM personal computers and compatibles including: COBOL compilers and utilities, relational databases, and much more. Call today to receive a **FREE** comprehensive Buyer's Guide, and find out why Programmer's Connection is your best connection for software tools.

Programmer's Connection

7249 Whipple Ave NW
North Canton, Ohio 44720

US 800-336-1166

Canada 800-225-1166
OH & AK (Collect) 216-494-3781
FAX 216-494-5260
Telex 9102406879
International 216-494-3781

**MVS
PRODUCTS/IDEAS**

Major software developer/marketer is interested in acquiring or representing high quality MVS, MVS/XA, CICS, TSO, VSAM, DASD performance/productivity optimizing software utilities, products or new ideas. We invite responses in absolute confidence to Box 35570 Monte Sereno, CA 95030

MARKETPLACE

Is Here!
Reach Over 612,000
Computer Professionals
Call for all the details
(508) 879-0700

Graphics/Desktop Publishing

COMPUTER DATA DISPLAYS

PC Screen to Large Screen

Look to BOXLIGHT—The LCD Specialist—For the Right System to Meet Your Needs.

**KODAK
DATASHOW**

*Eiki, Apollo, Chisholm and others.
Prices start at

\$599

Solutions for VGA, EGA, CGA, all MACs & more.
MC, VISA, AMEX & COD

**BOXLIGHT
CORPORATION**

(415) 892-4744
Computer-Based Presentation Systems
Since 1984

**Computerworld's
MARKETPLACE
Section**

Looking for a way to reach information systems professionals with your advertising message? Call a Computerworld product classified sales representative for all the details on the new Marketplace sections.

**(508) 620 7758
(508) 620-7759
(508) 620-7784**

Peripherals/Supplies

**GENUINE
HEWLETT
PACKARD
TONERS
\$79.50**

Huge Inventory In Stock
For Same Day Shipment Call
• 1-800-22-TONER
• 1-800-228-6637
Plotter Supplies At Similar Savings
TONERS PLUS...

**COMPUTERWORLD'S
Product Classified
MARKETPLACE**

Examines the issues while
Computer Professionals
examine your message.

Call for
all the details.

East
(508) 620-7784
West
(508) 620-7759
Midwest
(508) 620-7758

TRAINING

Finessing the training contract

You can enter into vendor negotiations well-armed with cost-cutting tools

BY BILL SEBRELL
SPECIAL TO CW

Should you have a contract with your training vendors? You bet you should. Are training managers good at negotiations and contracting? You bet they aren't.

The corporate contracts department might be able to help negotiate training contracts, but you better lay out the requirements very clearly or the department may go strictly by the vendor's list prices and foul things up. The legal department also might help, but it may take forever to get the contract out.

For these reasons, you are liable to find yourself on your own when negotiating contracts with vendors. Therefore, it is important to be aware of steps you can take to protect yourself and reduce your costs.

The interesting thing about contracts with training vendors is that the only time they come out of the drawer is when something goes very wrong. Unfortunately, in accordance with Murphy's Law, things that go very wrong often are not covered in the contract. But a contract can get some of the niggling issues out on the table and cleaned up before they become major problems.

If you are just going to run a

single three- or five-day class or a course on very short notice, you probably do not need an elaborate contract. Most vendors use standard agreements that cover the basics, including such things as the cost of the course, the number of students, which party will provide handouts, which one will pay for travel and living expenses, the place and time of sessions and cancellation fees.

Get it in writing

If you offer a lot of single courses through vendors, you may want to ask your legal department to draw up a standard agreement for all of your vendors. It can take the form of a letter. The agreement should ensure that the vendor owns the course and is not delivering another vendor's material and that your company is not liable for any injury to the instructor during travel or delivery of the course.

The agreement should also call for reasonable travel and living expenses, perhaps with specific standards for air travel, car rentals and taxis, hotel rooms, meals, entertainment, telephone calls and such things as laundry and dry cleaning. An alternative approach is to settle on a reasonable per diem rate and let the vendor fend for himself.

The agreement should specify a schedule for the vendor's arrival in the building, the time classes begin and end and the length of breaks. You should require the vendor to get your written approval to use your name in any advertising or to interview and hire any of your employees. You also may want to address necessary security is-

needs change.

- Plan a year's worth of classes over the course of your annual budget but set the contract for an 18-month term. This step provides a hedge: It allows you to push courses into the next budget year should something go wrong with your current budget.
- Do not be specific about dates. Allow the vendor to set the schedule for each quarter with your approval. In return, you should get a price break for providing the vendor with added flexibility.
- Be specific about the number

There are some other steps that might help reduce the rate, such as printing handouts yourself (perhaps for the vendor to use at other companies as well), providing graphic support, giving the vendor access to hardware to develop new courses and piloting new courses for the vendor.

Rent-a-chair

You also could let the vendor sell seats in your classes to other companies. You could let the vendor use your classes to groom new or junior instructors or let the instructors attend classes you run on your own. You can offer to provide references or allow the vendor's prospective customers to sit in on your classes.

The timing of payments also can make a difference. They might be required within 30 days of the course or up-front at the beginning of the year.

The bottom line is that contracts ensure long-term relationships with your vendors. Both parties would like to see a lasting and beneficial partnership, and there are innumerable opportunities to make that partnership successful. The objective of the contract is to provide quality service at a fair price on a regular basis, with everyone clearly aware of the rules.

Sebrell is a vice-president at Data Base Management, Inc., a subsidiary of American Management Systems, Inc. in Manchester, Conn.

YOU DO NOT get a discount unless you ask. You are contracting for a fixed number of days that the vendor can count on, so you should get a discount.

sues such as requiring the instructor to be a U.S. citizen.

For the best price breaks and for more long-term relationships, you should consider entering into annual contracts with your vendors. Each one should be unique to a vendor and should probably include all of the items noted in the standard letter agreement. You should also do the following:

- Negotiate a specified number of teaching days to be delivered during the period of the contract — not specific courses. This strategy provides the flexibility to modify what you offer to your internal clients should their

of students in a class and how you handle overflows. For example, you pay a flat fee for every student over the maximum or you dip into future teaching days.

- Be specific about when you can cancel a class and what you pay if you cancel beyond the limit.

There are some other things to consider to help you get a better rate from the vendor. You do not get a discount unless you ask. You are contracting for a fixed number of days that the vendor can count on, so you should get a discount. Also determine what happens to your rate if you conduct more classes than called for in the contract.

1989 Computerworld Editorial Contents

- | | | | |
|-------|--|------|--|
| 1/30 | - Product Spotlight: Micro-to-Host Links | *4/3 | - Executive Report: Cost Control & Justification |
| *2/6 | - Special Report: Communications Innovations | 4/10 | - Product Spotlight: PC's & Comptibles |
| 2/13 | - Special Report: Recruitment
Product Spotlight: Performance Management Tools | 4/17 | - Executive Report: Restructuring MIS - Distributing Resources |
| 2/20 | - Executive Report: Strategic Planning | 4/24 | - Executive Report: Managing after a Merger |
| *2/27 | - Product Spotlight: Relational DBMS | 5/1 | - Product Spotlight: Network Management Tools |
| *3/6 | - Special Report: Systems Integration
Executive Report: MIS in the Federal Government | 5/8 | - Executive Report: Automating the Data Center |
| 3/13 | - Product Spotlight: Disaster Prevention & Recovery | 5/15 | - Product Spotlight: Manufacturing Technology |
| 3/20 | - Executive Report: Human Resource Development | | |
| 3/27 | - Product Spotlight: CASE Products | | |

* Indicates Show Distribution

COMPUTERWORLD
CLASSIFIED MARKETPLACE

Where all computer buyers and sellers can go to market.

"Computerworld Response Card Decks really opened doors to the 'heavy-hitter' accounts..."

Spectrum Concepts, Inc. is a 10-year-old software developer based in New York City. The company, which provides software and services to large corporations and financial institutions, recently developed XCOM 6.2, an LU 6.2-based software product that dramatically improves file transfer between different computing environments.

XCOM 6.2 eliminates the need for extensive custom programming when transferring data from one computer to another, including PCs, mainframes and minis. And it significantly lessens the amount of time necessary to complete connectivity projects.

Company president Alec Gindis was impressed with industry reaction after a news story announcing XCOM 6.2 appeared in *Computerworld*. So when Spectrum began implementing its marketing strategy for the new product, he considered *Computerworld* a key resource.

"Our goal was to generate sales leads from major organizations — Fortune 500 and Fortune 1000-type companies — that need to transfer files. We decided to use response card decks, and, based on the reaction we got to that product announcement, Computerworld's was the card deck we thought of first."

"And it's paid off; the results have been terrific. We've received hundreds of high-quality leads so far, and they're still coming in. In fact, Computerworld Response Card Decks really opened doors to the 'heavy-hitter' accounts — major organizations that learned about us through the cards."

"Now we've gotten to where we are recruiting additional account executives to follow up on the volume of these leads. Computerworld Response Card Decks give us the best cost per lead of any medium. They also let us refine our marketing strategies through scientific 'split testing' — something other card decks don't always offer. We consider that a valuable bonus."

Computerworld Response Card Decks give you a cost-effective way to reach a powerful buying audience of over 127,000 computer professionals. They're working for Spectrum Concepts, Inc. — and they can work for you. Call Norma Tamburrino, Account Manager, *Computerworld* Response Card Decks, at (201) 967-1350 to reserve your space today.



— Alec Gindis
President
Spectrum Concepts, Inc.

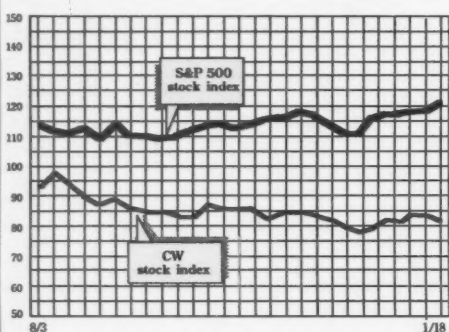
COMPUTERWORLD RESPONSE CARD DECKS

Computerworld is an IDG Communications Newspaper

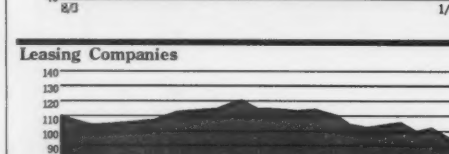
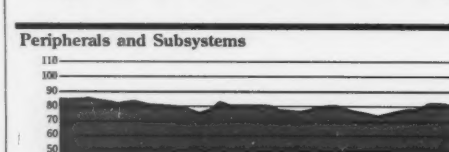
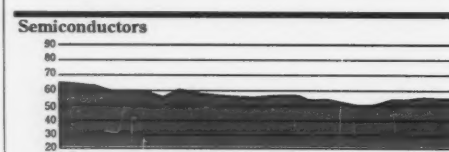
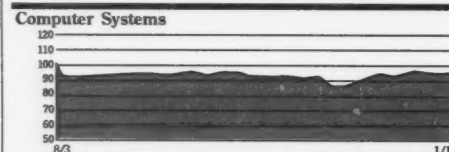
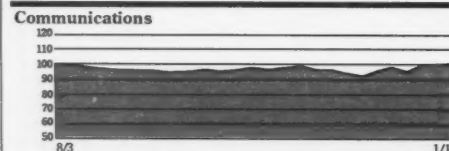
Publisher / Fritz Landmann

115

STOCK TRADING INDEX



Indexes	Last Week	This Week
Communications	100.0	100.6
Computer Systems	94.6	94.1
Software & DP Services	107.0	105.8
Semiconductors	54.9	55.0
Peripherals & Subsystems	81.6	79.0
Leasing Companies	95.6	89.9
Composite Index	83.0	81.6
S&P 500 Index	118.9	120.8



8/3 1/18 CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JAN. 18, 1989

EXCH	52-WEEK RANGE	CLOSE	WEEK NET CHG	WEEK PCT CHG
(1)	(1)	(1)	(1)	(1)
Communications and Network Services				
N AMERICAN INFO TECHS CORP	98 85	95.875	0.6	0.7
N ANDREW CORP	20 13	19	-0.5	-2.6
N ARTEL COMM CORP	3 1	1.563	0.0	0.0
N AT&T	30 24	29.75	0.9	3.0
N AVENT GARDE COMP INC	8 4	5.5	-0.4	-6.4
N AYON CORP	17 13	15.5	0.1	0.8
N BELL ATLANTIC CORP	75 64	72	1.4	1.9
N BELLSOUTH CORP	44 37	40.25	0.6	1.6
N COMPRESSION LABS INC	5 3	3.375	0.0	0.0
N COMPTON NETWORK TECH	2 1	1.907	0.3	22.0
N CONTEL CORP	43 31	42.25	0.4	0.9
N DATA SWITCH CORP	10 5	5.875	0.0	0.0
N DIGITAL COMM ASSOC	38 17	22.875	0.0	0.0
N DYNATECH CORP	24 17	19	0.5	2.7
N FERRONICS INTERNATIONAL	5 2	4	-0.1	-3.0
N GANDOLF TECHNOLOGIES	8 5	5.5	0.0	0.0
N GENERAL DATACOMM INDS	5 3	4.75	-0.5	-9.5
N INFOSTRON SYS CORP	14 8	10.5	0.0	0.0
N ITT CORP	55 44	52.625	0.6	1.2
N M/A COM INC	11 8	8.625	-0.3	-2.8
N MCI COMMUNICATIONS CORP	25 10	23.125	0.3	1.1
N NETWORK EQUIPMENT TECH	23 14	18	0.8	4.3
N NETWORK SYS CORP	12 7	9.5	-0.5	-5.0
N NORTHERN TELECOM LTD	20 16	16.5	0.3	1.5
N NOVELL INC	33 28	29.875	0.6	2.1
N NYNEX CORP	67 61	61.5	0.0	0.0
N PACIFIC TELECOM GROUP	33 26	31.25	0.0	0.0
N PRAIRIE CORP	10 4	10.125	0.1	1.3
N PRCORP INC	10 7	4.375	0.0	0.0
N PLESSEY PLC	41 25	39.875	0.1	0.3
N SCIENTIFIC ATLANTA INC	16 10	13.75	0.9	6.8
N SOUTHWESTERN BELL CORP	43 34	41	-1.0	-2.4
N 3COM CORP	25 16	22.625	-0.1	-0.7
N U S WEST INC	60 50	58	0.4	0.7
Computer Systems				
N ALLIANT COMPUTER SYS	9 3	3.625	-0.2	-4.9
N ALPHA INDUSTRIES	8 4	6.25	0.0	0.0
N AUTOS COMPUTER SYS	13 7	7.75	-0.3	-3.1
N AMENH CORP	28 14	20.5	-0.1	-0.6
N APOLLO COMPUTER INC	17 7	8.375	0.3	3.3
N APPLE COMPUTER INC	48 36	39.75	-2.4	-5.6
N BOLT BERANEK & NEWMAN	19 10	10.75	0.3	2.4
N BRITTON LEE INC	3 2	3.25	0.0	0.0
N COMPAQ COMPUTER CORP	66 42	60.75	-1.1	-1.8
N COMPUTER AUTOMATION INC	14 3	4.5	-0.8	-14.3
N COMPUTER CONSOLES INC	13 5	12.5	0.0	0.0
N CONCURRENT COMP CORP	7 4	4.75	-0.5	-10.0
N CONTROL DATA CORP	31 16	20.875	-1.0	-4.8
N CONVEY COMPUTER CORP	89 53	63.125	3.6	6.1
N CRAY RESH INC	12 6	6.25	0.3	4.2
N DATA GEN CORP	28 17	18.25	-0.1	-0.7
N DATAPoint CORP	6 4	4.625	0.3	6.7
N DELL COMPUTER CORP	13 8	9.25	0.0	0.0
N DIGITAL EQUIP CORP	127 86	96.625	0.0	0.0
N FLOATING POINT SYS INC	5 2	3.125	-0.1	-3.8
N HARRIS CORP	33 24	28.25	0.0	0.0
N HEWLETT PACKARD CO	66 44	53.125	0.5	1.0
N HONEYWELL INC	77 55	61.25	-0.1	-0.2
N IBM	130 104	125	2.8	2.2
N INFORMATION INTL INC	18 11	14.5	0.0	0.0
N IPL SYS INC	5 1	4.875	-0.1	-2.5
N IMA BASIC FOUR INC	21 8	8.125	-0.1	-0.8
N MATSUSHITA ELECT IND LTD	230 169	170	-4.0	-2.3
N MEGADAT CORP	7 1	1.75	0.0	0.0
N MENTOR GRAPHICS CORP	37 19	26.75	0.5	1.8
N NEW INC	7 1	1.625	-0.1	-7.1
N NCR CORP	70 51	54.875	-1.0	-1.8
N PRIME COMPUTER INC	20 12	18.75	-0.1	-0.7
N PYRAMID TECHNOLOGY	17 8	16	0.0	0.0
N SILICON GRAPHICS CORP	25 14	17.75	0.3	1.4
N STRATUS COMPUTER	32 20	28	0.5	1.8
N SUN MICROSYSTEM INC	26 13	17.625	0.0	0.0
N SYMBOLICS INC	2 1	0.938	-0.1	-6.2
N SEQUENT COMPUTER SYS	20 14	18.875	-0.1	-0.7
N TANDEN COMPUTERS INC	22 12	18.25	1.3	7.4
N TANDY CORP	49 33	38.375	-1.9	-4.7
N ULTIMATE CORP	17 9	9	-0.3	-2.7
N UNISYS CORP	39 25	28.5	0.0	0.0
N WANG LABS INC	17 8	8.5	-0.3	-2.9
Software & DP Services				
N ADVANCED COMPTech	3 1	1.813	0.1	3.6
N AMERICAN MGMT SYS INC	19 12	16.5	-0.4	-2.2
N AMERICAN SOFTWARE INC	17 9	17.125	0.1	0.7
N ANACOMP INC	12 6	7.125	0.3	3.6
N ANALYSTS INTL CORP	14 7	13.75	0.9	6.8
N ARISTON	21 7	21.75	-0.3	-1.1
N ASK COMPUTER SYS INC	16 7	15.75	0.0	0.0
N AUTODESK INC	31 16	28.75	-0.8	-2.5
N BMC SOFTWARE INC	15 8	15	-0.2	-1.5
N AUTO DATA PROCESSING	47 35	39	-0.3	-0.6
N BOOLE & BAGGAGE INC	12 7	11	-0.3	-2.2
N BUSINESS AND INC	15 8	13.25	-1.1	-7.8
N COMPUTER ASSOC INTL INC	34 24	32.75	-0.8	-2.2
N COMPUTER HORIZONS CORP	12 7	9.875	-0.3	-2.5
N COMPUTER SCIENCES CORP	53 38	50	0.0	0.0
N CORPORATE SOFTWARE	15 8	9.75	-0.3	-2.5
N COMPUTER TASK GROUP INC	17 10	13.25	0.3	1.9
N COSMOS INC	9 5	9.125	0.3	3.3
N COMSHARE INC	25 13	21.5	-1.0	-4.4
N CULLINET SOFTWARE INC	9 4	6.375	0.0	0.0
N CULDESQUE INC	24 16	21.25	-0.5	-2.3
N GENERAL MTRS (CLS E)	46 35	46.125	2.8	6.0
N HOGAN SYS INC	6 3	4.875	0.3	5.4
N INFORMIX CORP	25 7	7.875	-0.3	-3.1
N INTELLICORP INC	4 2	3.375	0.0	0.0
N KEANE INC	16 15	14	-0.3	-1.8
N LOTUS DEV CORP	34 15	16.5	0.1	0.6
N MANAGEMENT SCIAMER	14 6	8.875	0.1	1.4
N MICRO PRO INTL CORP	4 2	2.125	-0.1	-2.9
N MICROSOFT CORP	71 45	51.5	-1.0	-1.9
N MORINO ASSOCIATES INC	20 12	18.25	0.3	1.4
N NATIONAL DATA CORP	32 19	24.5	-0.5	-2.0
N ONLINE SOFTWARE INTL INC	18 4	4.75	0.0	0.0
N ORACLE SYS CORP	22 11	20.75	0.5	2.5
N RANSONIC SYS INC	19 12	14.25	-0.1	-0.9
N PROCKIT TECHNOLOGIES INC	18 12	15	-0.2	-1.8
N POLICY MGMT SYS CORP	26 19	24.25	0.3	1.0
N PROGRAMMING & SYS INC	18 9	17	0.3	1.5
N RABBIT SOFTWARE INC	3 2	3	0.0	0.0
N RELATIONAL TECHNOLOGY	21 12	15	-0.1	-0.8
N REYNOLDS & REYNOLDS CO	27 17	25.5	0.4	1.5
N SEI CORP	22 14	16.5	0.0	0.0
N SHARED MED SYS CORP	27 14	16.375	-1.1	-6.4
N SAGE SOFTWARE INC	8 5	7.25	-0.5	-6.5
Semiconductors				
N ADV MICRO DEVICES INC	17 7	8.625	0.0	0.0
N ANALOG DEVICES INC	18 10	12.375	-0.4	-2.9
N ANALOGIC CORP	10 6	9.375	0.4	4.2
N CHIPS & TECHNOLOGIES INC	21 11	15	1.0	7.1
N INTEL CORP	37 19	24	0.0	0.0
N LSI LOGIC CORP	34 17	10.75	0.5	4.9
N MICRON TECHNOLOGY INC	28 12	15.25	-0.8	-4.4
N MOTOROLA INC	55 36	42	0.0	0.0
N NATL SEMICONDUCTOR	15 8	8.875	-0.4	-4.1
N TEXAS INSTRS INC	57 35	41.875	0.5	1.2
N WESTERN DIGITAL CORP	18 11	13.25	-0.3	-1.9
Peripherals				
N ALLOY COMP	5 2	2.375	-0.1	-5.0
N AM INTL INC	6 3	5	0.0	0.0
N AST RESH INC	17 7	7.75	-0.3	-3.1
N AUTO TROL TECH CORP	6 3	4.75	-0.1	-2.6
N BANCORP INC	12 6	10.5	0.4	3.7
N CIPHER DATA PRODS INC	10 7	9.875	-0.1	-1.3
N COGNITRONICS CORP	4 2	2.438	-0.1	-2.5
N CONCOR PERIPHERALS	10 7	8.375	-0.4	-4.3
N DATAPRODUCTS CORP	15 8	13.625	-0.6	-4.4
N DATARAM CORP	9 6	7.5	0.1	1.7
N EASTMAN KODAK CO	51 39	46.125	1.3	2.8
N E MC CORP MASS	19 4	4.875	-0.1	-2.5
N EMULEX CORP	12 5	11	-0.8	-6.4
N EVANS & SUTHERLAND	23 13	16.25	0.4	2.4
N IOTI CORP	5 2	2.5	0.0	0.0
N INTERLEAF INC	21 6	8.75	-0.6	-6.7
N IOWEGA CORP	5 2	3.5	-0.3	-6.7
N LEE DATA CORP	4 3	2.75	-0.3	-8.3
N MASSOR SYS CORP	4 2	3.25	0.1	1.9
N MAXTOR CORP	16 6	8.375	-1.1	-11.8
N MICROPOLIS CORP	30 7	7.375	-0.3	-3.3
N MINISCORE CORP	14 6	7.375	-0.3	-3.3
N MINNESOTA MNG & MFG CO	67 55	61.75	0.6	1.0
N PERSONAL COMPUTER	7 5	4.75	-0.1	-2.6
N PRAM CORP	3 1	1.063	-0.1	-10.5
N PRINTRONIX INC	11 7	8	-0.1	-1.5
N QMS INC	12 6	8.25	0.1	1.5
N QUANTUM CORP	15 10	14	-0.6	-4.3
N RECONITOR EQUIP INC	12 6	11.75	-0.3	-2.1
N REXON INC	9 4	6.625	-0.1	-1.9
N SEAGATE TECHNOLOGY	23 7	9.375	-0.6	-6.3
N STORAGE TECH CORP	4 1	1.75	0.0	0.0
N TANDON CORP	3 1	1.063	0.0	0.0
N TEKTRONIX INC	30 19	22	0.5	2.3
N TELYENDEG SYS INC	2 0	0.313	-0.2	-37.4
N XEROX CORP	63 50	59	-0.4	-0.6
Leasing Companies				
N AMPULCOM INC	19 10	18.75	0.0	0.0
N CAPITAL ASSOCIATES INTER	7 4	8.25	0.0	0.0
N NATIONAL INC	25 17	22.125	0.1	0.6
N CONTINENTAL INFO SYS	9 0	0.688	-0.7	-50.0
N LDI CORPORATION	14 10	12.75	-0.5	-3.8
N PACEWAY AMER INC	4 3	3.375	0.3	12.5
N SELECTERM INC	6 4	5.25	0.3	5.0

EXCHN=NEW YORK/A=AMERICAN/Q=NATIONAL

Boomerang

Computer firms' fears of domino effect are calmed with a strong finish

The late Sir Isaac Newton got it just about right: When an apple falls on you, you are likely to discover gravity. Microsoft Corp., Compaq Computer Corp. and IBM were among the computer companies feeling a sense of gravity around the middle of last week, when price rollbacks and a slip in gross margins announced by Apple Computer, Inc. set off a wave of insecurity in the usually robust microcomputer market.

By Thursday, however, IBM's own fourth-quarter earnings report powered the stock back to 124 1/4 — a 1/2% increase over 123 1/4 at the week's start. Similarly, Microsoft announced strong December quarter sales and profits; its stock closed on Thursday up 1/4 of a point, at 53 1/2. Compaq pre-announced a fourth-quarter triumph and saw its stock pick up 1 1/2 points from the week's start, closing Thursday at 63 1/2.

Digital Equipment Corp. turned in a disappointing fourth-quarter profit performance. Rising revenue and overall great expectations based on recent and imminent product debuts, however, fueled DEC stock to a 104 1/4 Thursday close — a gain of 5 points from the week's start.

NELL MARGOLIS

IBM profits rebound; DEC spins wheels

BY NELL MARGOLIS
CW STAFF

Fueled by stellar sales of its AS/400 minicomputers, IBM logged a double-digit percentage increase in profits and a 9.3% revenue rise that left analysts assured that the industry giant is back.

Meanwhile, in Maynard, Mass., hefty research and development expenses and continuing softness in U.S. sales of its high-end entries handed Digital Equipment Corp. a disappointing profit picture. Analysts, however, hailed DEC's better-than-expected revenue and placed prod-

ucts above profits.

In Mountain View, Calif., Sun Microsystems, Inc. announced dazzling results for its second fiscal quarter ended Dec. 30: revenue of \$448.3 million, up 91% from last year's comparable quarter, and a profit surge in excess of 100%, from last year's \$14 million to \$29.5 million.

The strong sales performances of Sun, DEC and IBM reiterated a message already being sounded throughout the industry as earnings reports began flooding in early last week: Users want new products, on time, in working shape — and will tolerate nothing less. It was a mes-

sage that many companies did not heed in the December quarter (see story page 93).

IBM reported fourth-quarter revenue of \$20 billion, up 9.3% from last year's comparable period. Net earnings for the company increased 12% to \$2.35 billion.

Moreover, said Shao Wang, an analyst at Smith Barney, Harris Upham & Co., the company showed its best operating margins for any quarter since 1985.

Don't ask

"The question is no longer, Has IBM turned around?" Wang said. "Now it's, How strong is the turn?"

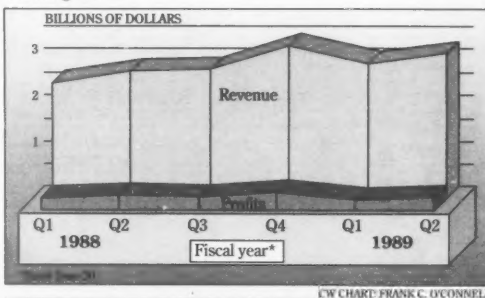
The December quarter yielded several reasons to believe that the answer will be "very," Wang noted. The AS/400 — IBM's most recent entry in a minicomputer market that once appeared to be IBM-proof — looms particularly large in the company's rising revenue picture, with continued heavy demand forecast by analysts.

Other product lines, including the recently available S series mainframes, also contributed to the healthy earnings. A program launched to prompt employee attrition and consequently cut costs for the company worked and then some, paring some 6,500 from the employee rolls in place of the 3,000 to 4,000 expected by the company.

While the separation costs associated with the exodus gener-

Stalled march?

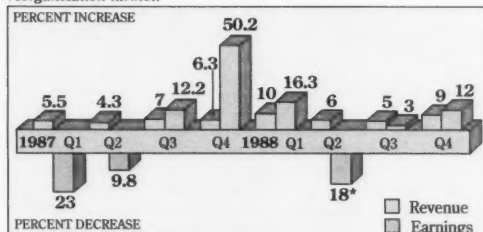
DEC's profit growth appears to have hit a snag, despite year-to-year revenue growth



CW CHART: FRANK C. O'CONNELL

Starts and stops

IBM ended fiscal 1988 on a high note, following a year of reorganization turmoil



*Reflects \$600 million reorganization expense

CW CHART: DOREEN DAHLE

VAX power

FROM PAGE 1

has been a popular member of the VAX family since it brought symmetrical multiprocessing to the heart of the VAX line upon its introduction last April [CW, April 25].

Observers say you can't blame DEC for sticking with a winner, even if the chance exists that the more powerful 6300 will cannibalize some of the 6200's sales. "The company has to stimulate its U.S. business, so why not embellish a product that is already moving?" said Barry F. Bosack, an analyst at the New York-based Robert Fleming Se-

curities Ltd. research house.

Users say the increased power and potential of the new models make upgrading an attractive option. "If you compare the cost increase with the performance increase, we'd be fools if we didn't upgrade," said Gene Burson, manager of the 6210-equipped Toledo Edison Co. in Toledo, Ohio. "We see the 6300 as nothing more than a welcome extension to the 6200."

The 6300 series also addresses mid-range pressure from IBM's 9370 and Application System/400. "DEC has realized that they have to respond to inroads that IBM has made with the AS/400, and the best way to do that is beef up its own mid-

range," said Terry Shannon, director of the DEC Advisory Service arm of International Data Corp. in Framingham, Mass. "Better than continue to milk sales of the 8800, which isn't doing too well anyway."

Observers said the 6300 could go a long way in finishing off the 8800 series, which has been the victim of lackluster sales and faces future internal pressure from above. DEC scientists are reportedly working feverishly on an air-cooled high-end uniprocessor, code named Aridus, that can process 15 to 20 MIPS and is expected for release this summer.

The move is also seen as boosting the performance of its

on-line transaction processor (OLTP) VAX line, as symmetrical multiprocessing is better suited than a uniprocessor to OLTP applications.

One-two punch

Analysts described the upcoming rollouts as the latter half of a one-two product punch from DEC. "Their recent desktop product announcement focused so much on the low end that they need to put some attention back on the mid-range," said Bob Randolph, director of program services with Technology Financial Services, Inc. in Westford, Mass. "So the message will be: 'Dear customer: We are viable at both ends of our product line.'"

The 6300's introduction will also follow DEC's mid-range modus operandi of offering a mid-life kicker within a year after a product's release. The 8600's introduction in November 1984, for example, was followed by the 8650 in late 1985.

Tomorrow's announcement will probably also include a server version of the 6300 based on the one- and two-processor models, sources said. Such a machine could tie in with their recent desktop product blitz [CW, Jan. 16], providing a mass data storage depository and communications controller node for the desktop machines.

CA, Microsoft log good Q4s

Computer Associates International, Inc. and Microsoft Corp., the leading software companies at the high end and low end, respectively, each issued the latest in a long line of impressive quarterly earnings reports last week.

CA announced fourth-quarter revenue of \$309.4 million, up 59% from last year's comparable period. Net income for the quarter was \$62.7 million, a 47% increase over last year's \$42.8 million profit figure. In a prepared statement, President Anthony J. Wang cited the smooth integration of recently acquired Applied Data Research, Inc. as a particular reason.

Microsoft reported a 35% increase in December quarter revenue, from \$155.9 million in last year's comparable quarter to this year's \$209.9 million. Net income was \$47.5 million, up 34% over last year's profit figure for the company's second fiscal quarter. The sales surge, a Microsoft spokesman said, reflected an increasingly strong contribution from international business, now responsible for 57% of Microsoft's overall revenue.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Copyright 1988 by CW Publishing/Inc. All rights reserved.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zooe Road, Ann Arbor, Mich. 48106. Computerworld is indexed; back issues, if available, may be purchased at \$2.00 per issue, plus postage. Call (800) 669-1002.

Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$0.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970.

Reprints (minimum 100 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 669-1002.

Requests for missing issues will be honored only if received within 60 days of issue date.

Subscription rates: \$2.00 a copy; U.S. — \$48 a year; Canada — \$110 a year; Central & So. America — \$130 (surface), \$250.00 (airmail) a year; Europe — \$195 a year; all other countries — \$295 a year. Four weeks notice is required for change of address.

Allow six weeks for new subscription service to begin.



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305.

TRENDS

RISC vs. CISC

When Jim Geers, president of AIM Technology, Inc., recently set out to test reduced instruction set computing (RISC) systems against complex instruction set computing (CISC) systems, he said he expected the RISC contenders to outperform the CISC challengers.

But he did not expect the RISC systems to beat the CISC ones as soundly as they did. In a series of Unix-based tests, the RISC systems consistently doubled and tripled the performance and capacity of CISC architecture machines.

Geers noted that for all their better numbers, the RISC systems still lack in the applications software area when put up against conventional processors.

"It appears to be a trade-off of performance and third-party software," he said. "If you're in the scientific area, then the RISC performance will be attractive. If you're in a business environment, then third-party applications are likely more important."

To test the two processor types, AIM started with a Digital Equipment Corp. VAX-11/780 as a reference point and judged the contenders against it. The test included only Unix-based systems for both sides. On the conventional side, Intel Corp. 80386-based processors and Motorola, Inc. 68030 processors were used. On the RISC side, offerings from Sun Microsystems, Inc., Hewlett-Packard Co. and Mips Computer Systems, Inc. were used.

For the system performance test, AIM established the VAX-11/780 as operating at 100%. Against that 100%, the RISC systems tested at an average of 680%. The CISC challengers averaged 308%.

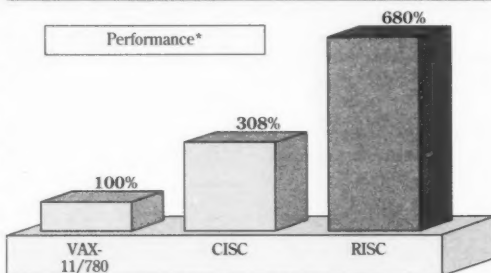
The RISC system average was boosted primarily by the performance of the HP system, which came in at 1,004%.

To establish an average number of users that the two system types could accommodate, AIM used a 12-user VAX-11/780 configuration as the reference point. The RISC systems supported an average of 91 users when compared with that base, and the CISC systems supported an average of 37 users.

Geers said a comparison of processor speed alone would not be fair to users because they rely on other system components as well, such as disk, memory and floating-point performance.

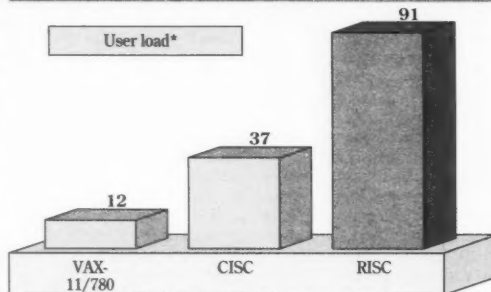
ROSEMARY HAMILTON

RISC systems outran CISC...



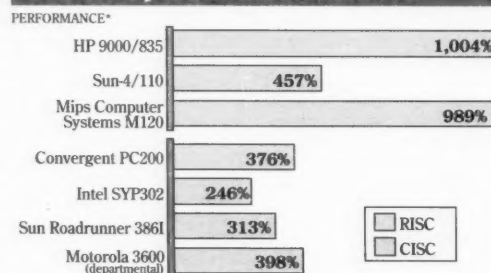
*Benchmarks based on comparisons with a typical DEC VAX-11/780, rated at 100%

...and supported more users



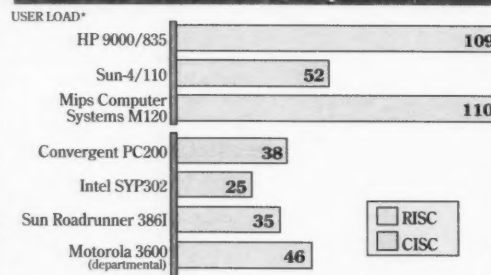
*Benchmarks based on comparisons with a typical DEC VAX-11/780, rated as supporting 12 users

Scattered performance results...



*Typical VAX-11/780 = 100%

...were echoed in user capacities



*Typical VAX-11/780 = 12

SOURCE: AIM TECHNOLOGY, INC.
CW CHARTS

INSIDE LINES

Coming soon, a choice in Unix mainframes. Just when Amdahl thought it had the Unix mainframe market all sewn up after National Advanced Systems closed down its external Unix development shop late last year, a new competitor shows up on the doorstep. Feb. 13, Pyramid Technology is expected to expand its RISC-based Unix minicomputer line to low-end mainframes. And, unlike Amdahl's proprietary brand of Unix, Pyramid's is said to be based on an open standard.

And, or... Not only is Pyramid entering the mainframe world, Gene Amdahl's latest start-up, Andor, is still intent on getting a prototype of its low-end IBM-compatible mainframe operating by this summer. Look for availability of this supposedly tiny system, with a price tag aimed at undercutting low-end IBM 3090s by late 1990.

Nothing personal. It's costing DEC customers an additional \$3,300 in hardware for the Vaxstation 3100 to run Decwindows, said John Logan, vice-president of the Aberdeen Group, a market research firm in Boston. The "personal VAX," a diskless Vaxstation with a processor capable of 3 MIPS and a monochrome terminal, could have been sold for \$5,500, Logan said. But to ensure that users would run the memory-demanding Decwindows, DEC loaded the system with 8M bytes of memory for an \$8,000 price tag. For customers not interested in Decwindows, the 1-MIPS Vaxstation 2000 with 4M bytes of memory sells for only \$5,200.

Maybe later. As expected, Apple did not make any communications announcements at Macworld Expo, but word has it that Apple's next big batch of connectivity unveilings is slated for Feb. 8 at Dexpo. Tokentalk, Apple's token-ring card, could be slated for release in April, at either Macdex in Chicago or a Mac show in Washington, said an analyst quoting an Apple insider. This much-awaited adapter has reportedly undergone three revisions so far and will not be released until Apple has all its support pieces in place, he said. Another source adds that Apple has had a working token-ring card for about a year.

Sitting down to tea. X/Open is expected to announce today new members, one of which will be a Japanese computer maker. (Fujitsu is already a member.) X/Open's current member roster consists of seven Open Software Foundation members, seven Unix International members, and one neutral firm (Nokia Data). With that lineup, one might imagine that it could be hard to reach a consensus on some issues. The new members are likely to shift the balance of power by adding more nonpartisan influence.

We'll send congratulations. Apollo has scheduled a press conference for next week. Anybody showing up for something new and completely different is in for a big surprise. The company apparently intends to "announce" that it is now ready to deliver the graphics component on its RISC-based workstations; the workstations were announced back in March 1988, and the graphics component was supposed to be ready by the end of the year. Although the Chelmsford, Mass.-based firm is all set to trumpet the 10000 series as the industry's first RISC-based graphics workstation, it seems that there's a little Mountain View, Calif.-based company called Silicon Graphics that has been including Mips Computer Systems RISC CPUs on its Iris 4D workstations for some time now. Ardent Computer also has a similar RISC-based machine. All in all, it makes you wonder just how gullible Apollo thinks its customers are.

Hold back the dancing persons. DEC's recent desktop extravaganza went to new artistic lengths with a multimedia presentation and an opening video that portrayed dancers in an office-setting complete with DEC workstations. Not seen, however, were live dancers who were to act out the video. They were canceled at the last moment after somebody gave it a second thought. If you know the details to this seamy inside political scenario, call News Editor Pete Bartolik at the hot line number, 800-343-6474 or 508-879-0700, and we'll let everyone in on it.



ACCEPT OUR OFFER AND YOU CAN WORK ANYWHERE YOU WANT.

Buy a PowerMate® Portable SX and a P5300 printer for your office. And get a free P2200 printer (a \$555 value) for your home.

As a confirmed workaholic, your work rarely ends when the vacuum cleaners start up at the office. With a PowerMate Portable SX in hand, that's when you head home for a few more hours of peak productivity.

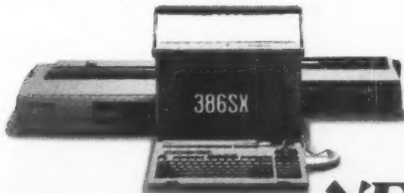
The PowerMate Portable SX is a fully featured, high performance desktop computer serious enough to be your only office PC by day. Light enough to carry home by night.

Powered by the Intel® 386SX™ chip running at a 16 MHz processing speed, this machine is built to handle all current 286 software as well as the growing world of sophisticated 386 applications.

Its 42 MB hard disk, up to 16 MB of memory, and 3 full size expansion slots guarantee you plenty of room to grow. And with outstanding VGA resolution, the easy to read gas plasma display supports 16 shades for dazzling graphics.

Buy one before March 31st, with a Pinwriter® P5300 printer for your office, and we'll toss in a second printer for your home, the reliable 24-wire Pinwriter P2200 at no charge.

So call 1-800-NEC-INFO (in Canada, 1-800-343-4418) for the name of the authorized PowerMate reseller nearest you. And remember. The sooner you call, the sooner you can get back to work. Wherever that may be.

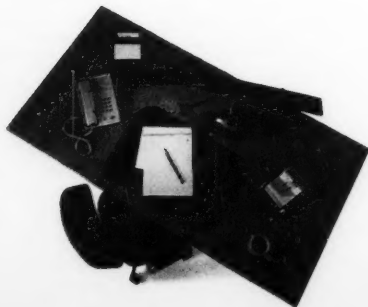


CC

NEC

NEC Information Systems, Inc., Dept. 1610, 1414 Massachusetts Ave., Boston, MA 01119

Intel is a registered trademark and 386SX is a trademark of Intel Corp. PowerMate and Pinwriter are registered trademarks of NEC Corp. © 1989 NEC Corp. Offer valid from 1-3-89-3-31-89. Both PowerMate Portable SX and P5300 must be purchased together from an authorized NEC PowerMate reseller.



NOT ALL FINANCIAL SOFTWARE IS CREATED Equal

INTRODUCING FULL MAINFRAME FINANCIAL SOFTWARE FUNCTIONALITY— ON THE PC.

Now you can run the *same* Data Design mainframe financial software on *both* your mainframe and your PC. Throughout your corporation. Exactly the same. Equal.

Data Design's exclusive Equal architecture makes it all possible.

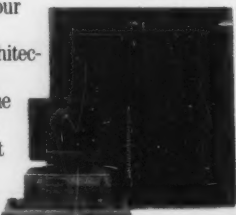
From corporate headquarters to the smallest remote office, anyone can take advantage of sophisticated management software. Software used by major corporations—from Alcoa to Pillsbury,

Bankers Trust to General Electric.

You save data processing and production costs since you only have one system to support. You can install, tailor, test and train without waiting for valuable mainframe resources.

And your PC users don't have to settle for PC software.

Equal financial systems *fit* your business needs, without changing the way you do business. Equal systems *adapt* to new corporate strategies and easily assimilate changes due to mergers



and acquisitions. Equal systems *unify* your corporation.

Equal. Financial information the way you need it. On the mainframe. On the PC. Everywhere in your business enterprise. The foundation for distributed data processing. And your competitive edge in financial management software.

Let Data Design show you mainframe financial software that runs on a PC! In your office. Today. Call us at **800/556-5511, ext. 800.**



Providers of General Ledger, Accounts Payable, Purchasing, Fixed Assets, and Project Accounting Software.

Available on IBM 43XX, 30XX, 9370, PS/2, PC/AT, and compatibles, and DEC VAX. Equal is a trademark of Data Design Associates, Inc. All others trademarked by others.

